Ron Roman

Water Resources Survey

Part I:

HISTORY OF LAND AND WATER USE ON IRRIGATED AREAS

and

Part II:

MAPS SHOWING IRRIGATED AREAS IN COLORS DESIGNATING THE SOURCES OF SUPPLY

Gallatin County, Montana

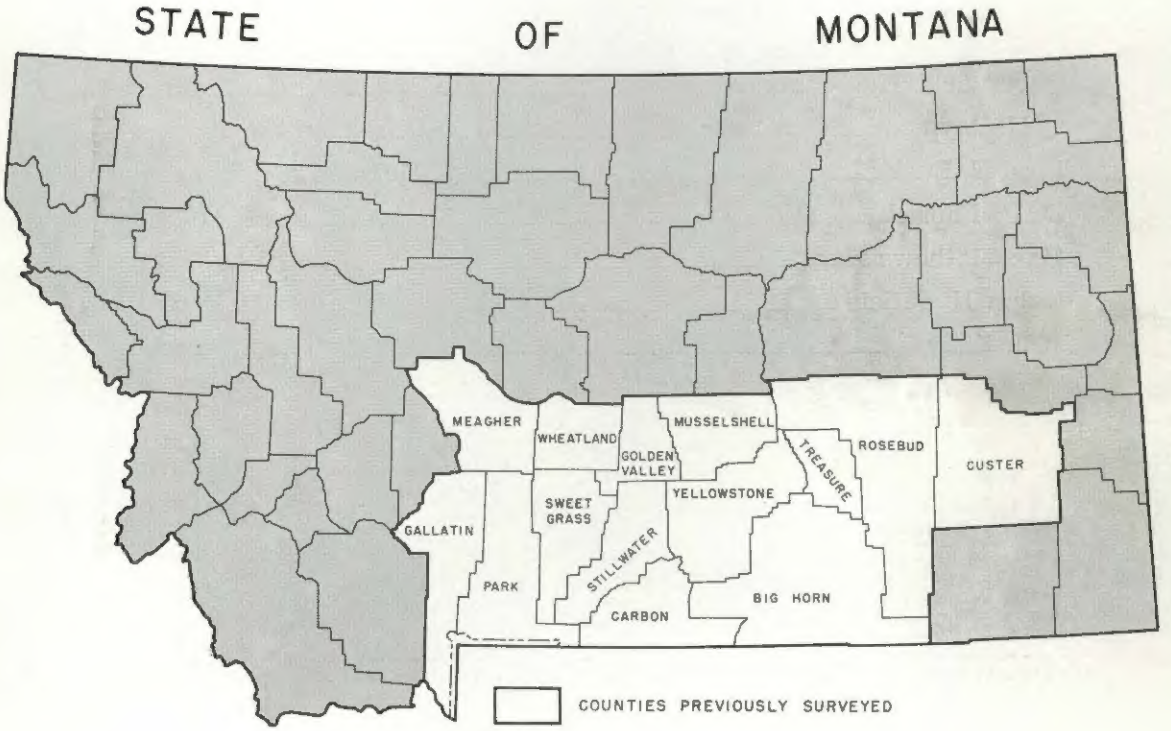
Published by
STATE ENGINEER'S OFFICE
Helena, Montana, January, 1953
(Reprint as of June, 1961)

WATER RESOURCES SURVEY

GALLATIN COUNTY
MONTANA

Part I

History of Land and Water Use
on Irrigated Areas



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January, 1953

Honorable J. Hugo Aronson
Governor of Montana
Capitol Building
Helena, Montana

Dear Governor Aronson:

Submitted herewith is a consolidated report on the Water Resources Survey of Gallatin County, Montana.

This work is being carried on with funds made available to the State Engineer by the 32nd Legislative Session, 1951, and in cooperation with the State Water Conservation Board and the Montana State Agricultural Experiment Station.

The report is divided into two parts. Part I consists of history of land and water use, irrigated lands, water rights, etc., and Part II contains township maps in the county showing in color the lands irrigated from each source or canal system.

Work has been completed and reports are now available for the following counties: Big Horn, Carbon, Custer, Gallatin, Golden Valley, Meagher, Musselshell, Park, Rosebud, Stillwater, Sweet Grass, Treasure, Wheatland, and Yellowstone.

The office files contain minute descriptions and details of each individual water right, and land use, which are too voluminous to be included herein. These office files are available for inspection to those who are interested.

The historical data on water rights contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up to date.

Respectfully submitted,

FRED E. BUCK, State Engineer

ACKNOWLEDGMENTS

A survey and study of water resources invloves many phases of both field and office work in order to gather the necessary data to make the information complete and comprehensive. Appreciation of the splendid cooperation of various agencies and individuals who gave their time and assistance in aiding us in gathering the data for the preparation of this report is hereby acknowledged.

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Harry Droge — Secretary, Lewis Ditch
D. M. Fulton — Secretary, Lower Middle Creek Supply Ditch
Guy Oman — Secretary, Perks Canal

The State Engineer's Office, Water Resources Survey, hereby expresses sincere appreciation to the many ranchers, farmers, and stockmen who have given their helpful cooperation in this survey.

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FOREWORD

MONTANA'S WATER RIGHT PROBLEMS

Our concern over surface water rights in Montana is nearly a century old. When the first Territorial Legislature, meeting in Bannack, adopted the common law of England on January 11, 1865, the Territory's legal profession assumed that it had adopted the Doctrine of Riparian Rights. This doctrine had evolved in England and in eastern United States where the annual rainfall is generally more than twenty inches. It gave the owners of land bordering a stream the right to have that stream flow past their land undiminished in quantity and unaltered in quality and to use it for household and livestock purposes. Since the law restricted the use of the water to riparian owners and forbade them to reduce appreciably the stream flow, the early miners and ranchers in Montana favored the Doctrine of Prior Appropriation which permitted diversion and diminution of the streams. Consequently, the next day the legislature enacted a law which permitted diversion by both riparian and non-riparian owners. Whether or not this action provided Montana with one or two definitions of water rights was not settled until 1921 when the Montana Supreme Court in the Mettler vs. Ames Realty Co. case declared the Doctrine of Prior Appropriation to be the valid Montana water right law. "Our conclusion," it said, "is that the common law doctrine of riparian rights has never prevailed in Montana since the enactment of the Bannack Statutes in 1865 and that it is unsuited to the conditions here . . . "

The appropriation right which originated in California was used by the forty-niners to divert water from the streams to placer mine gold. They applied to the water the same rules that they applied to their mining claims—first in time, first in right and limitation of the right by beneficial use. Those who came to the Montana gulches brought with them these rules, applying them to agriculture as well as to mining.

The main points of consideration under the Doctrine of Prior Appropriations are:

1. The use of water may be acquired by both riparian and non-riparian landowners.

2. It allows diversion of water regardless of the reduction of the water supply in the stream.

3. The value of the right is determined by the priority of the appropriation; i.e., first in time is first in right.

4. The right is limited to the use of the water. Stream waters in Montana are the property of the State and the appropriator acquired only a right to their use. Moreover, this use must be beneficial.

5. A right to the use of water is considered property only in the sense that it can be bought or sold; its owner may not be deprived of it except by due process of law.

The State Legislature has provided methods for the acquisition, determination of priority and administration of the right. No right may be acquired on a stream without diversion of water and its application to a beneficial use. On unadjudicated streams, the Statutes stipulate that the diversion must be preceded by posting a notice at a point of intended diversion and by filing a copy of it within 20 days in the County Clerk's office of the county in which the appropriation is being made. Construction of the means of diversion must begin within 40 days of the posting and continue with reasonable diligence to completion. However, the Montana Supreme Court has ruled that an appropriator who fails to comply with

the Statutes may still acquire a right merely by digging a ditch and putting the water to beneficial use.

To obtain a water right on an adjudicated stream, one must petition the District Court having jurisdiction over that stream for permission to make an appropriation. If the other appropriators do not object, the court gives its consent and issues a supplementary decree granting the right subject to the rights of the prior appropriators.

Inasmuch as the Montana laws do not require water users to file official records of the completion of their appropriations, it becomes advisable as soon as the demand for the waters of a stream becomes greater than its supply, to determine the rights and priorities of each user by means of an adjudication or water right suit. This action may be initiated by one or more of the appropriators who may make all the other claimants parties to the suit. Thereupon the Judge of the District Court examines the claims of all the claimants and issues a decree establishing priority of the right of each water user and the amount of water he is entitled to use. The court decree becomes in effect the deed of the appropriator to his water right.

Whenever scarcity of water in an adjudicated stream requires an allocation of the supply according to the priority of rights, the Judge, upon petition of the owners of at least 15 per cent of the water rights affected, must appoint a water commissioner to distribute the water. After the Commissioner has been appointed the Judge gives him full instructions on how the water is to be apportioned and distributed in accordance with the terms of the decree.

The recordings of appropriations in local courthouses provides an incomplete record of the water rights on unadjudicated streams. In fact, the county records often bear little relation to the existing situation. Since the law places no restriction on the number and extent of the filings which may be made on an unadjudicated stream, the total amount of water claimed is frequently many times the available flow. There are numerous examples of streams becoming over appropriated. Once, six appropriators each claimed all of the water in Lyman Creek near Bozeman. Before the adjudication of claims to the waters of Prickly Pear Creek, 68 parties claimed thirty times its average flow of 50 cfs. Today, the Big Hole River with an average flow of 1,129 cfs has filings totaling 173,912 cfs. A person is unable to distinguish in the county courthouses the perfected rights from the unperfected ones since the law requires no official recordation of the completion of an appropriation. Recognition by the courts of unrecorded appropriations adds to the incompleteness of these records. To further complicate the situation, appropriators have used different names for the same stream in their filings. In Montana many of the streams flow through several counties; consequently, water right filings on these inter-county streams are found distributed in two or more county courthouses. Anyone desirous of determining appropriations on a certain river or creek finds it difficult and expensive to examine records in several places. In addition, the records are sometimes scattered because the original nine counties of 1865 have now increased to 56. As the original counties have been divided and sub-divided, the water right filings have frequently not been transcribed from the records of one county to the other. Thus, a record of an early appropriation in what is at present Powell County may be found in the courthouse of the original Deer Lodge County.

It can be readily seen that this system of recording offers little protection to rights in the use of water until they are determined by an adjudication. In other words, an appropriator does not gain a clear title to his water right until after adjudication and then the

title may not be clear because the Montana system of determining rights is also faulty. In the first place, adjudications are costly, sometimes very costly when they are prolonged for years. It is estimated that litigation over the Beaverhead River, which has lasted more than twenty years, has cost the residents of the valley nearly a half a million dollars. In the second place, unless the court seeks the advice of a competent irrigation engineer, the adjudication may be based upon inaccurate evidence. In the third place, if some claimant has been inadvertently left out of the action, it is not final and may be reopened for consideration by the aggrieved party. Another difficulty arises in determining the ownership of a water right when land under an adjudicated stream becomes sub-divided in later years and the water not proportioned to the land by deed or otherwise. There is no provision made by law requiring the recording of specific water right ownership on deeds and abstracts.

The Legislative Session of 1957 passed Chapter 114 providing for the policing of water released from storage to be transmitted through a natural stream bed to the place of use. The owner of the storage must petition the court for the right to have the water policed from the storage reservoir to his place of use. If there are no objections, the court may issue this right and appoint a water commissioner to distribute the water in accordance therewith. This law applies only to unadjudicated streams.

Administration of water in an adjudicated stream is done by the District Court, but it has its drawbacks. The appointment of a water commissioner is often delayed until the shortage of water is acute and the court frequently finds it difficult to obtain a competent man for a position so temporary. The present administration of adjudicated streams which cross the county boundaries of judicial districts creates problems. Many of the water decrees stipulate head gates and measuring devices for proper water distribution, but in many instances the stipulation is not enforced, causing disagreement among the water users.

Since a water right is considered property and may be bought and sold, the nature of water requires certain limitations in its use. One of the major faults affecting a stream after an adjudication is the failure of the District Court to have some definite control over the transfer of water rights from their designated places of use. The sale and leasing of water is becoming a common practice on many adjudicated streams and has created serious complications. By changing the water use to a different location, many of the remaining rights along the stream are disrupted, resulting in a complete breakdown of the purpose intended by the adjudication. To correct this situation, legal action must be initiated by the injured parties as it is their responsibility and not the Court's.

At one time or another all of the other Western Reclamation States have used similar methods of local regulation of water rights. Now all of them except Montana have more or less abandoned these practices and replaced them by a system of centralized state control such as the one adopted by the State of Wyoming. The key characteristics of the Wyoming system are the registration of both the initiation and completion of an appropriation in the State Engineer's Office, the determination of rights and administration by a State Board of Control headed by the State Engineer. These methods give the Wyoming water users titles to the use of water as definite and defensible as those which they have to their land.

When Montana began to negotiate the Yellowstone River Compact with Wyoming and North Dakota in 1939, the need for some definite information concerning our water and its use became apparent. The Legislature in 1939 passed a bill (Ch. 185) authorizing the collection of data pertaining to our uses of water and it is under this authority that the Water

Resources Survey is being carried on. The purpose of this survey is six fold: (1) to catalogue by counties, in the office of the State Engineer, all recorded, appropriated and decreed water rights including use rights as they are found; (2) to map the lands upon which the water is being used; (3) to provide the public with pertinent water right information on any stream, thereby assisting them in any transaction where water is involved; (4) to help State and Federal agencies in pertinent matters; (5) to eliminate unnecessary court action in water right disputes; (6) and to have a complete inventory of our perfected water rights in case we need to defend these rights against the encroachments of lower states.

Ground water and surface water are often intimately related. In fact, it is difficult in some cases to consider one without the other. In times of heavy precipitation and surface runoff, water seeps below the land surface to recharge underground reservoirs which, in turn, discharge ground water to streams and maintain their flow during dry seasons. The amount of water stored underground is far greater at any given instant than the amount of surface water in Montana, and, without seepage from underground sources, it is probable that nearly all the streams in the State would cease to flow during the dry seasons.

It is believed that Montana's ground water resource is vast and only partly developed. Yet this resource is now undergoing a rapidly accelerating development as the need for its use increases and economical energy for pumping becomes available. Continued rapid development will undoubtedly cause waste and depletion of ground water in areas where it is not plentiful. Experience in other states has shown that once overuse of ground water in a specific area has started, it is nearly impossible to stop it, and may result in painful economic readjustments for the inhabitants of the area concerned.

Practical steps aimed at conserving ground water resources and correcting related deficiencies in surface water laws are necessary in Montana. Proposed ground water codes have been rejected by four sessions of the Montana Legislative Assembly, (1951, 1953, 1955, 1959) and proposed improvements of existing surface water laws have also failed to be enacted. The formulation and presentation of a workable ground water code, designed to protect and conserve Montana's ground water resources, to the next Legislature are essential if Montana is to avoid the problems that plague some of our sister states.

A ground water code must be based on full consideration of the intimate relation of ground water and surface water. A central filing office where all filings, well logs, and other records (past, present and future) for all water in use — ground or surface — should be provided for by any water code. Accurate records concerning water rights and amount of water available are essential in the administration and investigation of water resources. The availability of these records in a central office under the control of a responsible State agency will surely provide a stronger and more accurate basis for the negotiation of inter-state water compacts, as well as set up a means for the rapid evaluation of data for in-State litigation.

METHOD OF SURVEY

Water Resources data contained in Part I and Part II of this report are obtained from courthouse records in conjunction with individual contacts of landownership. A survey of this type involves extensive detailed work in both the office and field to compile a comprehensive inventory of water rights as they apply to land and other uses.

The material of foremost importance used in conducting the survey is taken from the files of the county courthouse and the data required includes: Landownership water right records (decrees and appropriations), articles of incorporation of ditch companies and any other legal papers in regard to the distribution and use of water. Deed records of landownership are reviewed and abstracts are checked for water right information when available.

Aerial photography is used by the survey to assure accuracy in mapping the land areas of water use and all the other detailed information which appears on the final colored township maps in Part II of the report. Section and township locations are determined by the photogrammetric system, based on government land office survey plats, plane-table surveys, county maps and by "on the spot" location during the field survey. Noted on the photographs are the locations of each irrigation system, with the irrigated and irrigable land areas defined. All the information compiled on the aerial photo is transferred and drawn onto a final base map by means of aerial projection. From the base map color separation maps are made and may include three to ten over-lay seperation plates, depending on the number of irrigation systems within the township.

Field forms are prepared for each landowner, showing the name of the owner and operator, photo index number, a plat defining the ownership boundary, type of irrigation system, source of water supply and the total acreage irrigated and irrigable under each. All of the appropriated and decreed water rights that apply to each ownership by the description of intended place of use are listed on the field form. During the field survey, all water rights listed on the field form are verified with the landowner. Whenever any doubt or complication exists in the use of a water right, deed records of the land are checked to determine the absolute right of use.

So far as known, this is the first survey of its kind ever attempted in the United States. The value of the work has become well substantiated in the counties completed to date by giving Montana its first accurate and verified information concerning its water rights and their use. New development of land for irrigation purposes by State and Federal agencies is not within the scope of this report. The facts presented are as found at the time of completing each survey and provide the items and figures from which a detailed analysis of water and land use can be made.

The historical data contained in these reports can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up-to-date.

Complete data obtained from this survey cannot be included in this report as it would make the text too voluminous. However, if one should desire detailed information about any particular water right, lands irrigated, or the number and amount of water rights diverting from any particular stream, such information may be obtained by writing the State Engineer's Office in Helena.

GALLATIN COUNTY

HISTORY AND ORGANIZATION

Gallatin County takes its name from the sparkling river which rises in Yellowstone National Park and provides the water for irrigating the rich lands of the Valley. The river was named by Lewis and Clark for Albert Gallatin, Secretary of the Treasury under Thomas Jefferson. Mr. Gallatin was from Switzerland and came to this country in 1779.

In July, 1805, the Lewis and Clark expedition arrived at the Three Forks of the Missouri. At that time Gallatin County was Indian country crossed by the hunting and fighting parties of various Indian tribes, but not the permanent abode of any of them. John Colter, who first discovered the wonders of the Yellowstone Park, passed through the county in 1808 near the present town of Willow Creek. There he was captured by the Blackfeet Indians, stripped naked by his captors and permitted to run for his life. From the description he gave of his remarkable exploit when he arrived at Fort Manuel near the mouth of the Big Horn River, he ran a distance of 245 miles in 7 days, unarmed, with only such food as he could gather on the way.

The discovery of the Bannack and Virginia City mines in the early 1860's brought a stampede of gold seekers into Montana, many of whom were unable to secure claims after they arrived. With farm products scarce, and prices high, a number of them sought land and found it in the fertile Gallatin Valley.

The first settlement in Gallatin County was made in the fall of 1862 at the mouth of the Gallatin. An association called the Gallatin Town Company was formed to lay out a townsite which became known as Gallatin City (often called East Gallatin). The company was chartered and the town incorporated by the first legislature in 1865. The first house in the Gallatin Valley was built at Gallatin City by Frank Dunbar in 1863, near the present town of Three Forks. The county seat was located at Gallatin City but was changed to Bozeman by vote of the people on Christmas day 1867.

In 1864, while John M. Bozeman was leading a wagon train over the trail he had blazed from the Oregon Trail to the Gallatin Valley, Daniel E. Rouse and Wm. J. Beall were laying out a townsite, staking claims for themselves and John Bozeman, and building the first houses on the site of the present city of Bozeman. Mr. Bozeman has been honored in the naming of the city of Bozeman, Bozeman Pass, Bozeman Creek (sometimes called Sour Dough Creek), and Bozeman Canyon. He was killed by Blackfeet Indians near the mouth of the Mission Creek east of Livingston in April, 1867, while he and Tom Coover were going to Fort C. F. Smith in behalf of the Coover & McAdow Mill to seek an order for flour.

The first irrigation ditches were dug in 1864 and the first wheat crop was raised by John Thomas that year. Large scale grain growing promoted the establishment of numerous flour mills, a malt plant, and brewery.

Fort Ellis was established as a military post three miles east of Bozeman, August 27, 1867, in charge of Captain R. S. LaMotte, with three companies of U.S. troops, for the protection of the people of this part of Montana territory from the Indians. The Fort was named in honor of Colonel Augustus Van Horn Ellis of the 124th New York Volunteers. It served not only as a frontier military post but also as a supply post for official parties visiting the

Yellowstone National Park. Many of the enlisted men stationed at Fort Ellis were sons of prominent eastern families who entered military service to see the frontier. Lt. Jerome, an officer there in 1872, was an uncle of Winston Churchill. The Fort was inactivated in 1886 and except for a few years in the early 1890's when it was used for the annual encampment of the State National Guard, its buildings remained empty until 1915 when most of them were destroyed. The last remaining one, a former hospital, is today the farm home of a Montana Experiment Station.

The first school in the county was taught by Samuel Anderson in the winter of 1865-66 in Bozeman. Gallatin County High School was organized in 1898, and Montana State College was established in 1893. The first newspaper in the county, The Montana Pick and Plow, was published in 1869. The Bozeman Chronicle began as a weekly in January, 1882.

After years of financial difficulties the Northern Pacific Railroad reached Bozeman on March 21, 1883. The event was the scene of a big celebration, for it ended years of effort to secure much needed transportation facilities, upon which the prosperity of the valley depended. Telegraph connections were established between Bozeman and Helena on November 11, 1871, and the telegraph line was completed to Bismarck to connect with eastern lines on March 20, 1880.

Indicating the business done in Gallatin County during the year 1878, it is noteworthy that the two principal hotels in the city of Bozeman registered 14,000 guests. Bozeman was the outfitting point for Yellowstone Park, and its adjacent canyons, lakes, falls, and hot springs furnished recreation areas of charm and beauty. All the mountain and valley areas abounded with game and the rivers and streams were a fisherman's paradise.

The townsite of Belgrade, which is located 10 miles northwest of Bozeman, was established in 1883 by Thomas B. Quaw and family and incorporated in 1906.

The town of Manhattan, incorporated in 1911, was established in 1884 near the old town of Hamilton. The more valuable buildings in Hamilton were moved to Manhattan.

Three Forks was originally surveyed on a site near its present location in 1882. When the Milwaukee railroad was built in 1909, the present town developed and was incorporated. The town was named from its proximity to the place where the Jefferson, Madison, and Gallatin Rivers meet to form the Missouri. It is located where the first settlement and seat of Government of Gallatin County were located. A monument to Sacajawea, the Indian woman guide for the Lewis & Clark expedition, was placed here by the Daughters of the American Revolution in 1914.

Logan, a junction of the Northern Pacific Railroad is located between Manhattan and Three Forks, and was originally called Cannon House but was renamed in 1883 when the railroad acquired the right-of-way there from Odelia Logan.

Near the north end of the Gallatin Canyon is Gallatin Gateway, originally known as Salesville and named for Zacharia Sales who owned a sawmill there. The name was changed in 1927 when it became the starting point for trips by bus through Yellowstone National Park.

West Yellowstone which is near the southern tip of Gallatin County, was settled in 1907-08 and became an official entrance to Yellowstone Park in 1907. Its principal source of

support has been the tourists who annually enter and leave the Park during the summer season.

Amsterdam was established west of Belgrade by a group of Hollanders brought here by Rev. A. J. Wormser in 1893. The original settlement consisted of 9 families.

Anceney is the southern terminal of the Northern Pacific branch from Manhattan. It was named after Charles Anceney who once controlled a huge ranch in the vicinity consisting of several thousand acres.

Two of the earliest towns, Gallatin City and Hamilton, are nearly forgotten. Chestnut, once supported by coal mining industry, has only a few remains to show that a town once existed. A community on the foothills of the Bridger Range called Springhill leaves only a name which now is applied to a rural district in the area where the village was built.

Other small settlements include Trident which has a cement factory; Bozeman Hot Springs, a health and recreation center: and Central Park, Menard, Maudlow, Sedan, and Willow Creek.

These are a few of the basic facts in the history of Gallatin County, a rich and picturesque history, to which all districts and localities in every corner of the county have had something to contribute.

Gallatin County had, in 1950, a population of 21,902, ranking 7th among the counties of the State. In area, the county ranks 25th, totaling 2,517 square miles. Extreme distances are: 50 miles from east to west along the base line and 116 miles from north to south between Ranges 5 and 6 East. Bozeman, the County Seat, has an elevation of 4,771 feet, while the valley is from 4,500 to 4,600 feet above sea level. Gallatin County is bordered on the north by Broadwater and Meagher Counties, on the east by Park County and the Yellowstone Park, on the south by the State of Idaho, and on the west by Broadwater and Madison Counties.

TRANSPORTATION

Gallatin County has very good transportation facilities. The main line of the Northern Pacific Railway runs through the north central part of the county. Two main lines enter the county from the west, one at Sappington Junction, and the other at Lombard, meeting at Logan, making connections with Helena and Butte. From the east the main line enters the county from Livingston at the east end of the Bozeman tunnel. A branch line serves the area south of Manhattan as far as Anceney station, to load out grain and livestock.

The Milwaukee Roads' main line enters the Northern part of the county from Ringling in Meagher County and follows Sixteen Mile Canyon, the Missouri and Jefferson rivers on the north and west boundaries of Gallatin County. A branch line starting at Three Forks serves Manhattan, Belgrade, Gallatin Gateway, Bozeman, and Menard. The latter being a grain elevator in the north central part of the county.

At the southern end of the county the Oregon Short Line branch of the Union Pacific Railroad from Idaho Falls serves the town of West Yellowstone and the Yellowstone Park during the summer months.

The county is adequately supplied with federal, state, and county roads. U.S. Highway No. 10 parallels the Northern Pacific track from east to west. U.S. Highway No. 191 courses

south from Bozeman through scenic Gallatin Canyon to West Yellowstone, entrance of the Yellowstone National Park, and on into Idaho. State Highway No. 1 begins at Sappington Junction and follows a southerly route through Madison County where it enters Gallatin County, two miles west of Hebgen Lake. From this point State Highway No. 1 follows the north shore of the lake to its Junction at Duck Creek with State Highway No. 191. A short cut route, State Highway No. 187, connects with State Highway No. 89 above Wilsall. The Northern Greyhound Bus Lines have a daily schedule from both east and west on U.S. Highway No. 10.

The main line of the Northwest Airlines has daily scheduled flights from Gallatin Field at Belgrade, which provides excellent air travel connections to any part of the U.S. There are two other airports or emergency landing fields in the county, being located at West Yellowstone and Three Forks.

CLIMATE

As is the case with most counties in the southwestern part of Montana, topography plays a very important part in the climate of Gallatin County. In general the mountainous sections are both wetter and cooler than the fairly broad valley floors of the northern half. In the southern half, which is quite mountainous, January has the largest precipitation normal, but there is a secondary peak in June. In the northern valleys the wettest months normally are May and June, with a secondary maximum in September. Abundant snowfall during most winters assures a quite dependable supply of water for valley irrigation during the growing season. The spring season is usually fairly cool and cloudy, with frequent periods of either showers or general rain.

Several periods of warm days with plenty of sunshine in the late summer and early fall are ideal for maturing crops and harvesting. Thunderstorms, sometimes accompanied by hail, are frequent from June through August. While hail can occasionally cause damage, widespread or severe damage is rare. Strong winds are sometimes observed in exposed areas, but Gallatin County is not known as one of the windy sections of Montana. Tornadoes are practically unknown.

Stations with long weather records are located at Bozeman on Montana State College grounds and at Hebgen Dam, while shorter but good records are on file for Trident, Belgrade, and West Yellowstone. Figures from these stations are quite representative for their immediate vicinities, and are listed below:

Station	Years Record	Normal Annual Temp.	Highest	Lowest	Normal Annual Precip.	Wettest Year	Driest Year
Belgrade	10		100°	—43	12.97	19.70 (1948)	12.12 (1946)
Bozeman	58	41.9°	112°	—53	18.03	32.63 (1885)	10.54 (1934)
Hebgen Dam	48	35.8	99	—60	23.42	38.87 (1938)	12.26 (1905)
Trident	14	43.9°	105°	—36	12.28	17.24 (1941)	9.81 (1939)
W. Yellowstone	29	35.3°	97°	—66	22.46	28.13 (1951)	11.98 (1929)

The —66° observed at West Yellowstone was in February, 1933, when the station was located at Riverside Ranger Station, about one mile east of the Yellowstone Park entrance. This is the coldest of record in the United States. On the other hand, several areas in the northwest corner of the county have relatively mild temperature averages.

The average date of the last killing frost in the spring at Bozeman is about May 24 and the first in the fall is about September 16 giving an average growing season between frosts of about 115 days. At Hebgen Dam the growing season averages only 88 days with the date of last killing frost in the spring expected around June 15 and the first in the fall about September 11. Frost or freezing temperatures are reported throughout the year at higher elevations such as West Yellowstone.

Several other stations have been established within the last year or two, but as yet insufficient records have accumulated to contribute much to the general climatic picture. Summarizing, Gallatin County climate is characterized by wide variations which are mostly associated with topography. The mountainous southern and northeastern parts are relatively colder and wetter than valley areas, and the northwest corner (Three Forks, Trident) is drier and warmer than any other section. Between West Yellowstone and Trident, for example, the normal temperature differences are of the order of nearly 9 degrees. At lower elevations the climate supports extensive agriculture, but higher elevations are limited mostly to livestock and other activities not too dependent upon a long growing season.

SOILS

Gallatin County is in southwestern Montana within the Rocky Mountain Physiographic Province. Its agricultural lands center in the Gallatin-Three Forks valleys and the intervening benches and footslopes which collectively form a broad inter-mountain basin of about 750 square miles. Another basin on the upper Madison drainage enters the county at West Yellowstone, but it is above 6,500 feet and of limited agricultural importance. Almost all of the other two-thirds of the county is rugged, mountainous terrain. Although elevations vary from about 4,000 to 11,000 feet, the farming areas are below 6,000 feet.

The underlying bedrock is chiefly folded and faulted limestones, shales, sandstones and volcanic mud flows which are locally intruded with granitic and volcanic rocks. Sediments in the basins are gravels and calcareous fine earths eroded from these formations.

Soils have developed in arid to humid, temperate climates with short cool summers and long cold winters, under both grassland and forest vegetation. Widely divergent kinds occur. Important Zonal Great Soil Groups which would be encountered in a traverse from Three Forks southeast to Bozeman and then south through the mountains to West Yellowstone are Brown (brown), Chestnut (dark brown), Chernozem (black calcareous) and Prairie (black acid) in the grasslands and Gray Wooded, Brown Podzolic and Podzol in the forests.

Only the soil in the Gallatin-Three Forks basin have been studied in detail. These are described by William DeYoung and L. H. Smith in the Soil Survey of the Gallatin Valley Area, Montana, published by the United States Department of Agriculture in cooperation with the Montana Agricultural Experiment Station as Soil Survey No. 16, Series 1931.

The soils in this area have been derived chiefly from Tertiary Age sediments which have been modified by wind and stream action and by Pliestocene outwash from the mountains. The well drained black soils occur only in an area bordering the Gallatin and Bridger ranges on the southern and eastern edges of the basin. They are as productive as any dryland farming soils in the state. With irrigation they will also produce high yields of hay and peas. Surface soils range in texture from coarse loam to silty clay. The Bridger soils

are characterized by somewhat gravelly or cobbly loam to clay loam surface soils and porous to slowly permeable subsoils containing many rock fragments. They occupy the mountain footslopes and high outwash fans. In general they are leached of lime to 3 feet or more and have acid surface soils. The Bozeman soils which are below the Bridger in the vicinity of Bozeman, being developed in wind-sorted silts, are stone-free to depths of six feet or more. They are leached about as deeply as the Bridger soils but have more nearly neutral surfaces. The Millville soils which occupy an extensive area in the vicinity of Springhill Station differ from the Bozeman in having gravelly lower subsoils. They are also somewhat lighter colored.

The dark brown soils occupy well drained sites in a zone extending across the basin from Gallatin Gateway northeast to Springhill School. Under irrigation they are equally as productive as the black soils, but under dryland conditions they are a little less productive because of lower rainfall. The principal soil is Bozeman silt loam, brown phase which is developed in wind-sorted silts.

The brown soils predominate in the two-thirds of the basin to the west of the soils already described. Because of limited rainfall they are not as productive under dryland conditions, but under irrigation the deep types are equally as productive as the other groups. The most extensive deep soils are types of Amsterdam and Manhattan, which are developed in wind-sorted silts and fine sandy loams. They differ from the Bozeman soils in having lighter colored thinner surface and subsoils and higher lying lime horizons. Principal shallow soils are the Beaverton and sandy and gravelly phases and types of the Manhattan, which occupy extensive gravel terraces in the vicinity of Belgrade and Manhattan. Ashuelot gravelly loam, a lime hardpan soil, occupies some of the high benches south of Three Forks.

Extensive areas of imperfectly to poorly drained soils occur along Gallatin, Madison and Jefferson rivers and on the broad fan terrace immediately west of Bozeman. In the latter area types of Huffine are the chief soils. They are imperfectly drained moderately deep, loamy soils adapted to the production of a fairly wide variety of crops under irrigation. River bottom soils include types of the Gallatin, Minatare and Havre soils. These vary in drainage from imperfect to swampy and in depth from very deep to shallow. Their crop adaptation is variable. Some are as well suited to farming as the Huffine soils; others are usable only as pasture.

Non-agricultural lands include river wash along the major streams and rough broken and mountainous land. Particularly the latter includes much productive range.

Outside the Gallatin Valley area the county is predominantly mountainous. Scattered areas of gravelly alluvial soils occur along the major streams and some grassland soils occur on the lower mountain slopes. There are a few parklands at the higher elevations and some fairly extensive gravel terraces with forest soils near West Yellowstone. Much of the land is in National Forests or Parks.

CROPS

Gallatin County has a land area of about 1,610,800 acres of which about 65 percent is mountainous and largely included in the National Forest Reserve. Of the total land area,

58.3 percent is in farms. There are approximately 112,000 acres of agricultural land under irrigation while approximately 150,000 acres are in non-irrigated crop land.

The Gallatin Valley is one of the oldest and most productive agricultural regions in the state. The principal crops produced in the valley have been about the same since 1880, although the importance of the various crops and their acreage has changed from time to time. Wheat always has been an important cash crop. Since 1910, a large though variable acreage of the dryland has been devoted to this crop. In 1952, approximately 60,000 acres were seeded to winter wheat and 30,000 acres to spring wheat.

The principal crops grown in the county are winter wheat, spring wheat, alfalfa and grass hay, barley, oats, canning peas and potatoes. In most years the valley produces a surplus of hay and feed grains. Canning peas are processed locally and have earned a reputation for their fine quality. Also located in the county are several flour mills and livestock feed processing plants which provide a local market for wheat and surplus feed grains and hay.

LIVESTOCK

Gallatin County is the home of nationally known herds of purebred cattle, Hereford, Angus and Shorthorn being particularly well represented. The 1952 assessment showed a total of 5,814 head of purebred beef cattle. The claim has been made that there are more purebred beef cattle in Gallatin than in any other county in the United States. Commercial beef cattle production is of major importance also.

Dairying has increased in importance since 1900 until today it ranks next to the beef industry in income produced. There are about 5,000 dairy cattle in the county and almost a fifth of these cows are included in the Gallatin Dairy Herd Improvement Association. The average butterfat production for all cows on test in 1952 was 381.5. Most of the dairy produce is marketed as fluid milk. The general quality of the cattle is very good. Much improvement has come about in recent years through an artificial breeding program.

Much of the progress in the dairy industry has come about through cooperative action by dairymen in various associations such as the Dairy Herd Improvement Association, Dairy Breeders Association, Milk Producers Association and the Cooperative Creamery.

Sheep rank second in total numbers being exceeded only by beef cattle. Although there has been considerable reduction in numbers, the sheep industry is still of considerable importance. Most of the sheep are included in farm flocks which are run on irrigated pastures in the summer and fed during the winter. About three-fourths of the wool produced in the county is marketed cooperatively through the Gallatin Sheep Association. The Columbia is the predominant breed in the valley.

WATER SUPPLY

Gallatin County drainage areas consist principally of streams flowing into the Missouri River tributaries. Along the east border of the County, however, the drainage flows down the east slope of the mountains and into the Yellowstone River. The headwaters of the Mis-

souri River are in, or bound, the county. These headwaters and their tributaries furnish irrigation water for the extremely fertile valleys. Water is diverted into seventeen incorporated ditches, five principal mutual ditches, and numerous other mutual and private ditches.

The topography of Gallatin County consists of a valley formed by the Bridger, Gallatin, and Madison Ranges of mountains. In pre-historic time, a lake existed having three principal arms, one extending up each of the present Gallatin, Madison and Jefferson River Valleys. Gallatin County encompasses all of the former Gallatin Lake and the lower portions of both the former Jefferson and Madison Lakes. These lakes were eventually filled with sediment and subsequent erosion formed the present topography. There still exists a subterranian dam or barrier located approximately at the head of the Missouri River which holds back underground waters, keeping the water table high in the three river valleys. The only visible outlets of this underground water are numerous springs and artesian wells in the vicinity of the barrier itself.

Gallatin River

The Gallatin River is formed by the confluence of the East and West Gallatin Rivers at a point approximately two miles north of the town of Manhattan. There is but little irrigation from the Gallatin River itself, but considerable from the two branches above the forks.

East Gallatin River

Rocky Creek and Bridger Creek merge with Bozeman Creek to form the East Gallatin River at a point approximately one mile north of the city of Bozeman, thence follows a winding course north and west until it meets with the West Gallatin River to form the main Gallatin River. Tributaries flowing into the river from the north and of importance to irrigation are: Bear Creek, Bostwick Creek, Cottonwood Creek, Dry Creek, Foster Creek, Reese Creek, Ross Creek, and Smith Creek. The principal irrigation canal in this drainage area belongs to the Dry Creek Irrigation company. Of greatest importance in the south drainage area are Bozeman Creek, and Hyalite or Middle Creek. In addition to irrigation, Bozeman Creek contributes to the water supply for the city of Bozeman. The State Water Conservation Board constructed a dam across Hyalite or Middle Creek for storage of flood waters to contribute to irrigating facilities in the upper Gallatin Valley. The project was started September 16, 1939, and was completed and began storing water in the fall of 1950. This project will be a supplemental source of domestic water for the city of Bozeman. The sale of this water is accomplished through the Middle Creek Water Users' Association. Numerous private and mutual ditches also irrigate land throughout both the north and south drainage areas.

West Gallatin River

High in the Gallatin Range of mountains, within the boundary of Yellowstone National Park, the West Gallatin River is formed and runs in a northerly direction until its confluence with the East Gallatin River. Tributaries draining the rugged mountains feed this river making it a wonderful source of water for irrigation in the Gallatin Valley below. This river with its tributaries furnishes water for the bulk of irrigation in the Gallatin Valley.

Jefferson River

The Jefferson and Missouri rivers form the northwest boundary of Gallatin County. Sand Creek and Willow Creek are the only tributaries that contribute to irrigation within the county. A reservoir to store water on Willow Creek was completed by the State Water Conservation Board in August, 1938, the water being distributed by the Willow Creek Water Users' Association.

Madison River

In Yellowstone National Park the Madison River is formed by the junction of the Firehole and Gibbon Rivers. It flows from the Park into Gallatin County approximately two miles east of the town of West Yellowstone, northwesterly through Hebgen Lake, and into Madison County. It re-enters Gallatin County about eighteen miles south of the town of Three Forks, and twenty-five miles west of Bozeman, and runs north to the head of the Missouri River. Tributaries to the Madison River within Gallatin County are Denny Creek, Dwelle Creek, Elk Creek, Pulsifier Creek, Red Canyon Creek, and the South Fork of the Madison River. All of the lower Madison Valley is irrigated from the Madison River through private and mutual ditches on both river banks.

Sixteen Mile Creek

Sixteen Mile Creek enters Gallatin County from Meagher County near the center of the north boundary, flowing south and west into the Missouri River near the town of Lombard. Only two main tributaries are within Gallatin County, those being the Middle and South Fork of Sixteen Mile Creek. Irrigation is very scattered, and in small pieces in this drainage area.

Yellowstone River

Flathead Creek and Brackett Creek originate in Gallatin County and flow into the Shields River, a tributary of the Yellowstone River. Trail Creek and Tom Miner Creek flow directly into the Yellowstone River. Flathead Creek with its tributaries is the only source of irrigation for an area on the east slope of the Bridger Range, extending from the mountains down through the Flathead Valley to the Shields River. Only a small amount of area in Gallatin County is irrigated from any of the other Yellowstone River tributaries.

Summary

The supply of water in Gallatin County is believed to be generally adequate. Poor irrigation practices on the part of some users is causing a waste of water, and depriving other land of its use. The waste of water on higher areas, and seepage from the too numerous ditches is causing some land in the valley bottoms to become water-logged. This once productive land is now of no use except as pasture, some of it growing nothing more than swamp grass. If present practices continue all crops will eventually be grown on bench lands and higher elevations, while the fertile valley lands will be reduced to only stock raising. Due to a naturally high water table, (a result of the previously described geological formation), the flooding of fields in higher areas will only cause the seepage problem to be more pronounced. This shows that if more water is brought in from other sources to irrigate present dry land more valley land will be made unproductive.

The Gallatin County area is one of the first in the state to have been irrigated, and the individual irrigation systems have grown as the economy has made them necessary, with no regard to the overall benefit of the area. The time has now arrived for large scale administration and consolidation. In many cases, due to the slope of fields, and nature of soils, sprinkle irrigation should replace flood irrigation to conserve water and reclaim land. Ditch lining through seeped areas is both a conservation and reclamation measure immediately necessary. Ditch cleaning and general maintenance are other conservation measures to be taken at all times.

There are several localities where numerous parallel ditches could be consolidated into one canal and placed under one management and thus save operating expense and conserve the water supply.

STREAM GAGING STATIONS

The United States Geological Survey carries on the work of measuring stream flows in cooperation with funds supplied by the State and several Federal agencies. The results are published yearly in book form. The last publication was 1949. Therefore, data given below on average flow, maximums and minimums covers the period from the beginning of measurements through the year 1949. The water year, as published in the books, begins October 1 and ends September 30 of the following year.

Following are equivalents useful in converting from one unit of measurement to another:

(a) In Montana, one cubic foot per second equals 40 miner's inches.

(b) One acre foot is the amount of water required to cover an acre one foot deep.

(c) One cubic foot per second will nearly equal two acre feet (1.983) in 24 hours.

(d) A flow of 100 miner's inches will equal five acre feet in 24 hours.

(e) One miner's inch flowing continuously for 30 days will cover one acre 1½ feet deep.

Jefferson River

There are records of flow at two stream gaging stations on the Jefferson River; one, at Silver Star; and the other, at Sappington. The lower gage, the only one in the County, is located ½ mile North of Sappington. A record of gage heights only is available from November, 1894 to 1896. Discharge records began in September, 1896 and continued to November, 1905, and were not resumed again until August, 1938, when a recording gage was installed and records are continuous since then.

The drainage area is 8,980 square miles; average discharge, 2,211 cfs; maximum discharge, 19,900 cfs (6/6/48); minimum, 134 cfs (8/12/40). There are many diversions above the station, and flow is regulated by two storage reservoirs.

Willow Creek

There are two gaging stations on Willow Creek; one, 2½ miles northeast of Harrison; and the other five miles south of the town of Willow Creek. There is also a station on Norwegian Creek, a tributary of Willow Creek.

Records at the upper station are continuous since April, 1938, except that there are no winter records prior to 1947. The drainage area is 88.4 square miles; maximum discharge, 725 cfs (6/27/44); minimum, 1.6 cfs (8/30/40); some diversions above the station.

Records at the lower site are continuous since October, 1947. From September, 1919 to December, 1932, and the period from May, 1946 to August, 1947, records are available at another station one-half mile up stream. There are few winter records prior to 1948. The drainage area is 148 square miles; maximum discharge, 650 cfs (7/31/48); minimum, 0.3 cfs (11/13/47); flow regulated by Willow Creek Reservoir completed in 1937.

Records on Norwegian Creek are available from April, 1938 to July, 1943, and from October, 1946 to 1951 when the station was discontinued. There are no winter records prior to 1947. The drainage area is 34.6 square miles; maximum discharge, 28 cfs (7/20/48); minimum, 0.8 cfs (8/15/40); many diversions are above the station, water at times is diverted into the headwaters from South Willow Creek for mining.

Madison River

Gaging station records of Madison River are available at: 1½ miles east of West Yellowstone; 500 feet below Hebgen dam; 2 miles below Madison Reservoir; 1½ miles below the mouth of Cherry Creek; and 5 miles south of Three Forks.

At the Three Forks station, which is the only station in the County, records are available from October, 1941 to September, 1950, when the station was discontinued. There are gage height readings only from September, 1893 to May, 1897 and discharge records from November, 1928 to September, 1932, at a site 6 miles down stream. The drainage area is 2,485 square miles; maximum discharge, 8,175 cfs (6/19/96); minimum 416 cfs (2/27/30); flow is regulated by Hebgen and Madison reservoirs, and some irrigation diversions. Some winter records are not very accurate on account of ice.

Gallatin River

Gaging station records available on the Gallatin river are: 8 miles south of Gallatin Gateway; 5 miles south of Salesville; and ½ mile west of Logan. Stations on tributaries are: Taylors Fork or Dodge Creek, 17 miles north of Grayling; East Gallatin at highway bridge north of Bozeman; Bridger Creek 3 miles northeast of Bozeman and Hyalite Creek 8 miles south of Bozeman.

At the station 8 miles above Gallatin Gateway, records are available from August, 1889 to June, 1894, and June, 1930 to the present time. The drainage area is 828 square miles; average discharge, 728 cfs; maximum, 6,800 cfs (June, 1892); minimum, 117 cfs (1/19/35).

At the station 5 miles south of Salesville, continuous records are available from August, 1895 to June, 1905. Fragmentary records are available from August, 1910 to July, 1913, and March, 1921 to June, 1923. The drainage area is 848 square miles; maximum flow, for the period of continuous record, 10,750 cfs (6/18/96); and minimum, 100 cfs (2/29 and 11/27-31/96). There are two diversions above the gage.

Records are available for the station near Logan from January, 1895 to December, 1905, and from August, 1928 to the present time. The drainage area is 1,805 square miles; average

discharge, 933 cfs; maximum, 7,870 cfs (6/5/48); minimum, 130 cfs (7/19/39). There are many diversions above the gage.

On Taylors Fork or Dodge Creek, the records are available from June, 1946 to the present time. The drainage area has not been measured; maximum discharge, 905 cfs (6/3/48); minimum, 12 cfs (2/9-10 and 4/5-11/47). There are some diversions above the gage and natural storage in lakes at the headwaters.

On the East Gallatin, records are available since August, 1939. The drainage area is 149 square miles; average discharge, 88.4 cfs; maximum, 1,170 cfs (5/21/48); minimum, 12 cfs (12/9/44). There are many diversions above the gage and diurnal fluctuations caused by a mill.

On Bridger Creek, records are available since January, 1946. The drainage area has not been measured; maximum discharge, 776 cfs (5/22/48); minimum, 2.7 cfs (9/1/49). There are some small diversions above the gage.

Middle, or Hyalite Creek, records are available since September, 1934. Fragmentary records are available from August, 1895 to October, 1900, and from May, 1902 to September, 1903. The drainage area is 45 square miles. The average discharge is 56.9 cfs; maximum, 956 cfs, (6/14/98); minimum, 0.4 cfs (2/2/39). There are no diversions above the gage, but the flow will be regulated by the Middle Creek Storage Reservoir completed in 1950.

Temporary Stations

There are 12 temporary gaging stations recently established for the purpose of making hydrological investigations which may be discontinued in September, 1953. The results of these measurements will be published in a special report by the Geological Survey which will deal with geology, ground water and surface water resources of Gallatin Valley. Sufficient information is not yet available to recite herein. The locations of these stations and the dates of establishment are as follows: Three, on the Gallatin river; one, on the Axtell bridge, 2½ miles north of Gallatin Gateway, April 18, 1950; the second, 3 miles southwest of Belgrade, April 18, 1950; the third, 3½ miles southeast of Belgrade, April 17, 1950, South Cottonwood, at the Wortman Ranch 6½ miles southeast of Gallatin Gateway, May 21, 1951; East Gallatin, 6 miles east of Bozeman, November 9, 1951; Bear Canyon, 6 miles southeast of Bozeman, November 12, 1951; Bozeman Creek ¼ mile above the City of Bozeman's settling basin, May 10, 1951, (operated previously by the State College); Middle Cottonwood, 6½ miles north of Bozeman, May, 1951; Ross Creek at the Martin Ryen Ranch, 10 miles northeast of Belgrade, May 22, 1951; Reese Creek, 7 miles northeast of Belgrade, May 25, 1951; Dry Creek on the Andrus Ranch, 8 miles northeast of Manhattan, October 10, 1951; and Dry Creek at the Brownell Ranch, 7 miles northeast of Manhattan, October 10, 1951.

Yellowstone Drainage

The only gaging stations on the Yellowstone drainage that effect Gallatin County are: On Bangtail Creek at its mouth, ½ mile northwest of Chadbourne; and Brackett Creek, 4 miles above its mouth. The drainage area has not been measured on either stream.

Records are available on Bangtail Creek from March to June, 1923. The maximum discharge during the short period was 88 cfs and the minimum, 1.5 cfs. There are 2,005 miner's inches of decreed water rights above the gage.

Records available on Brackett Creek are from April, 1934 to September, 1949; also from March, 1921 to September, 1923 at a gage site ¾ mile upstream. The average discharge is 27.5 cfs; the maximum, 1,400 cfs (5/22/48); and the minimum, 0.6 cfs (12/27/43). There are many small diversions above the gage.

MINING

Mining has played only a small part in the economic development of Gallatin County. Consequently the historical record concerning the county's mining operations is particularly barren.

Gold-placer operations apparently were intermittently active during the period 1880-1900 in the Spring Hill District along the Gallatin River, at West Fork, and at Taylors Fork west of Eldridge. Early output from these operations is unknown. Operations continued sporadically at small scale up to 1945. However, the annual output of gold from these ventures seldom exceeded a few ounces.

Production statistics record an output of 7,388 ounces of gold from Gallatin County during the period 1883-1947. During the period of 1901-47 the segregated statistics indicate that 30 ounces of gold was produced by lode mines and 99 ounces of gold was discovered from placer operations. Placer gold is known to have been recovered at 5 localities in Gallatin County since 1901. Operations at these deposits were sporadic and on a small scale.

Prospecting in the Pass Creek area (about 25 miles by county roads northeast from Belgrade, Montana) resulted in the discovery of base-metal deposits prior to 1901. The September Morn lode, evidentally one most important of these discoveries, was active for short periods in 1915, 1925, 1936, and 1939-40. Scale of operation at this property is indicated by a recorded aggregate output of less than 100 tons of ore.

In 1939 and 1940 a small output of lead ore was taken from the September Morn mine in the Bridger Range. Although a government-financed access road was completed in 1944, the September Morn mine has remained dormant to the present time.

The recognization in 1901 of amphibole asbestos at Karst can be considered one of the earliest lode discoveries of significance made in Gallatin County. However, production over the years has been sporadic, principally owing to marketing difficulties.

The Karst asbestos deposit is on the lower east flank of Wilson Peak at an altitude of 6,900 feet. It is 36 miles south of Bozeman, via Gallatin Gateway over U. S. Highway 191. The deposit, reputedly discovered by P. T. Karst in the early 1900's is believed to have yielded between 1,300-1,800 tons of crude ore; about 900 tons of which was produced and shipped to eastern markets during a period of 10 years following the deposits' discovery. In 1947 the property was acquired by the Interstate Products Company. Since that time a 3-mile access road connecting with U. S. Highway 191 has been built and several hundred tons of crude ore produced. The principal uses of amphibole asbestos are in the manufacture of fireproof wallboard and shingles, heat-insulating coverings, and acid-resistent filtration media.

Corundum-bearing deposits were discovered several miles west of Gallatin Gateway in 1901 and 1902. The aggregate output from these deposits up to 1903 is believed to have

amounted to more than 400 tons of corundum concentrates. The deposits were investigated by the Bureau of Mines during the recent war years because of an impending shortage of imported corundum.

Extensive exposures of limestone occur throughout Gallatin County. Limestone beds at Trident were opened in 1908 by the Ideal Cement Company to provide raw material for lime and Portland-cement manufacture. This operation has continued without interruption to the present time. The relatively flat-lying beds at Trident are exposed along bluffs in a narrow gorge cut by the Missouri River. The main quarry is opened by a 75 to 100 foot face, which extends for a distance of 3,000 feet along the bluff on the right bank of the river. A second quarry has been opened in a higher-grade stone about 2,000 feet southeast from, and stratigraphically above, the main quarry. The cement-plant output in 1948 was about 2,400 barrels daily.

Deposits of "onyx-marble" have been prospected about 6 miles north from Manhattan, Montana. Output from the deposits has been limited to a small amount of material extracted principally for exhibition and promotional purposes prior to 1932.

(Bureau of Mines Information Circular 7607)

STATE SOIL CONSERVATION DISTRICTS AND THEIR ACTIVITIES IN GALLATIN COUNTY

Gallatin County is included in three State Soil Conservation Districts. The Three Rivers District organized in 1944 covers the western part of the county. The Gallatin Valley District organized in 1949 comprises the eastern half of the county, with the exception of the headwaters of the Shields River drainage in the extreme northeast part of Gallatin County. This area is part of the Shields Valley District which extends into Park County.

These districts are organized under the State Soil Conservation Districts Act of 1939 and are locally governed by five local farmer-rancher supervisors elected by the land operators. These supervisors with the cooperation of the other land operators develop their own soil conservation programs predicated on the needs and conditions of the land resources and the wishes of the land owners.

The districts usually seek the assistance of local, state, and federal agencies in the development of their programs and also in the execution of these programs on the land. The Soil Conservation Service being the Federal agency established through an Act of Congress to assist farmers and ranchers in the technical phases of soil and water conservation have technical staffs located at Three Forks, Bozeman, and Livingston to assist the three districts. However, the districts have requested and secured assistance from the following additional Federal agencies: Forest Service, Production and Marketing Administration, Farmers Home Administration, Bureau of Reclamation, U. S. Geological Survey, and U. S. Army Engineers. State agencies assisting are: Montana Agricultural Experiment Station, Montana Extension Service, State Engineer, State Water Conservation Board, State Fish and Game Department, State Superintendent of Public Instruction, and State Attorney General's Office. Local organizations cooperating with the districts are: County Commissioners, highway districts, local water users organizations; local schools, farm organizations and clubs, which are used as a means of informing the people of the county on districts' activities.

Cooperation with a soil conservation district and the land occupier is voluntary. Land occupiers make their requests for technical and other assistance to the "supervisors" and they in turn make the districts' facilities available to the land occupier for conservation developments on his farm or ranch.

Districts cannot levy taxes. The technical services are free to the land occupiers. However, the farmer-rancher pays the cost of actual physical work done on his land. Districts own some equipment not generally available on the farm or have agreements with contractors that land occupiers can engage to do such work as earth moving and construction of irrigation and drainage facilities.

Since a majority of the valley lands in the county are irrigated, a large part of the districts' program consists of technical assistance in improved methods of utilizing irrigation waters, and drainage. Dry farm lands on the benches above the valley floor are vulnerable to both wind and water erosion and methods and practices for control of these menaces are becoming general throughout the districts. Range practices intended to control erosion and improve the range resources are being adopted. Some forest management and orderly harvesting and marketing of timber is being undertaken on a limited scale.

Soil Conservation Districts have as their objective "the use of each acre of agricultural land within its capabilities and the treatment of each acre of agricultural land in accordance with its needs for protection and improvement."

U. S. FISH AND WILDLIFE SERVICE, FISH CULTURAL STATION BOZEMAN, MONTANA

"During 1892 Professor S. A. Forbes, director of the Illinois State Laboratory of Natural History, made a survey of Montana, mostly limited to the Flathead region of western Montana, with visits to the Davies Springs, on Bridger Creek, at the entrance to Bridger Canyon 4 miles northeast of Bozeman. Of the hatchery sites examined in Montana, the most desirable for the proposed station was that embracing Davies Springs, near Bozeman. After a careful engineering survey, an option for the sale of the property at $3,500 was obtained. The site embraces some 78 acres of land on which are the Davies Springs, flowing between 1,200 and 1,500 gallons of water per minute. Certain rights connected with the water supply of Bridger Creek were also secured. The deed of William J. Davies and his wife transferring this property was dated May 20, 1893, and this document was duly transmitted to the United States. On June 26, 1893, the Attorney General, in a communication to the Commissioner, stated that this deed was sufficient to pass a valid title to the United States."

In 1894 a supplementary survey was made of the grounds, and plans for a hatchery and pond system were prepared. There remained on July 1, 1894, an available balance of $11,741.95 of the money appropriated for the construction of a fish hatchery at Bozeman, after paying for the land and incidental expenses. Plans and specifications were prepared for the construction of a fish hatchery, out buildings, and an ice house, and a contract entered into on December 24, 1894, with Peter T. Morris, the lowest bidder.

Owing to the severe climate and lateness of the season, the work was not begun until the latter part of April, 1895. Mr. Juan Jiminez was employed to superintend the laying out of the ponds, as well as the construction of the hatchery and other buildings. The greater

part of the work on water supply and ponds was finished late in the summer of 1895 when the available funds were exhausted. A further appropriation was granted June 8, 1896, and steps were at once taken to complete the station. James A. Henshall was appointed on the first of January, 1897, and reported to duty on the 11th of the month. During the winter brook trout eggs were received from Leadville, Colorado, and steelhead eggs were received from Fort Gaston, California.

The 1898 Report of the Commissioner of Fish and Fisheries states that for the purpose of increasing the water supply during the summer, a ditch 1,500 feet long, with the necessary headgates, etc., was constructed from a point in Bridger Creek, in the canyon to a large supply and settling pond located northwest of the hatchery at the head of the large rearing Ponds, in order that the water might be used during the summer and fall. This pond will also be supplied with water from warm springs on the opposite side of the creek which has a regular temperature of 77° throughout the year.

Recorded information on water rights is found in Book 1, Miscellaneous Water Rights on Page 393 and describes the Davies Springs only, no mention being made of any rights to Bridger Creek. However, certain rights to the water of Bridger Creek are mentioned in the original deed. Notice of Appropriation of waters of Bridger Creek is recorded in Book 5 of Water Rights, Page 33, records of Gallatin County.

Many changes, additions, and alterations have been made to the fish cultural station since 1899. At present only two of the original ponds are in use. The old horse barn or stable was moved from its original location and converted into a duplex affording living quarters for two families. A foreman's residence was constructed about 1919 and an addition to the hatchery building was built in 1933 and 1934 to house 30 more hatching troughs. An annex to the hatchery building was constructed in 1938 to house the heating plant. There are 70 troughs in the hatchery and the pond system consists of 12 concrete raceway ponds 6 feet wide by 60 feet long, 4 circular ponds 25 feet in diameter, 3 Foster-Lucas ponds 12½ feet wide by 55 feet long, and two of the original earth ponds.

The water supply from the cold springs to the hatchery and ponds is piped through a 14 inch welded steel pipe line. The water from the warm spring flows to the hatchery through a 6 inch welded steel pipe line. The system is arranged so that water flow from the warm spring into the cold springs when all of the warm spring water is not being used at the hatchery building. The water supply to the hatchery troughs is so arranged that a water temperature of from 48 to 75 degrees can be maintained as desired.

A reinforced concrete diversion dam was constructed in Bridger Creek in 1952 at a point about 100 feet below the warm spring structure for the purpose of diverting water from the creek to the rearing ponds through a 24 inch welded steel pipe line. The Bridger Creek water is used to supplement the spring water during the fall and winter when the flow from the springs is low. All of the water used in the hatchery and ponds is returned to Bridger Creek.

The hatchery was the first to successfully propagate the Grayling Trout; its chief output is the Rainbow, Eastern Brook, Loch Leven, and Black Spotted Trout.

Approximately 18,000 pounds of trout from 2 to 8 inches is being produced annually at the Bozeman Station of the U. S. Fish and Wildlife Service for planting in waters of Montana and Yellowstone National Park.

GALLATIN NATIONAL FOREST

The Bozeman, Gallatin, and Hebgen Lake Ranger districts of the Gallatin Forest are almost entirely within Gallatin County except for small areas extending into Park County on the east and Madison County on the west. The Shields, Yellowstone, and Gardner Ranger districts of the same national forest overlap slightly into Gallatin County along its eastern boundary but these intrusions are small. It may be said that the three ranger districts first mentioned constitute most of the national forest in Gallatin County.

These districts roughly include the western slopes and peaks of the Bridger Range, both sides of the West Gallatin Canyon from the river to the divides, the West Yellowstone Flat, and the rest of the upper Madison River drainage, outside Yellowstone National Park. The major part of this general area, approximately 579,244 acres, is in Gallatin County.

These public lands constitute the rough, mountainous parts of the County unsuited to conventional agriculture. They do, however, contain great natural resources that should be safeguarded and so administered as to yield large, varied and continuous benefits to the people of Gallatin County, to the State of Montana, and the Nation.

The most outstanding renewable resources contained in this rugged country are productive watersheds, wildlife, fish and game habitat, timber, forage, and recreational opportunities for thousands of people. Foremost in lasting value and real importance are the watersheds. From these high slopes comes clear water for domestic use, livestock, irrigation, power, and fish production throughout Gallatin County and far below on the Missouri River.

The condition of these watersheds is of tremendous import, now, and will be for many generations to come. Forest rangers, following a well defined policy, work hard to maintain and, if possible, improve watershed efficiency by close supervision of all land-use activities within their districts. Any use of land has an influence for good or evil upon the water holding capacity of the soil. Most surely is this true of the thin mountain soils with which these rangers work. Forest land administration must, therefore, be solidly keyed to watershed preservation and improvement.

A forest fire can, in an afternoon, destroy extensive stands of valuable timber that took a hundred years to grow. Fires burn next winter's forage and blacken the range. They kill wildlife and ruin wildlife habitat for indefinite periods, depending upon the severity of the burn. Fires deface beautiful recreation areas and demolish recreational facilities, but worst of all they completely disrupt the water-holding ability of good soil so that mountains and hills instead of absorbing water and holding it for gradual, continuous release, melt away in useless, over-whelming floods.

Ranger districts maintain written fire-prevention and fire-control plans which incorporate Forest Service personnel and equipment, logging operators, permittees, and local cooperators. These plans are co-ordinated annually with neighboring ranger districts and national forests and with Yellowstone National Park. District Rangers maintain a well-trained, hard-hitting first attack force bolstered by forest officers from the Supervisor's office in Bozeman and smoke-jumpers from Missoula. Fire tool caches are kept at strategic points throughout the forest, available on short notice to employees and volunteers alike.

Rancher cooperators and logging operators are furnished fire-fighting tools and given authority to hire men for fighting forest fires within their respective areas. Fire schools where instruction is given by forest officers are held for forest employees and local cooperators every spring. At these schools fire prevention objectives and fire control methods are demonstrated and discussed. The final day at each school is always devoted to the actual control and "mop-up" of a training fire set in a "jack-pot" of brush or slash where the cleanup affected will be an added benefit to the training.

All national forests in the Rocky Mountain Region are charged with the responsibility of keeping the annual burn in national forest commercial timber below .07 percent of the total acreage in that classification and below .116 percent of the total acreage protected which includes both national forest and private lands under fire protection agreements. Aided by excellent public cooperation and generally favorable weather, the Gallatin Forest has been able to meet this challenge since 1910. Far more difficult to attain is the goal set up on man-caused fires. For the Gallatin Forest this is six man-caused fires in any year. Only twice in the last five years has the Forest been able to reach this objective in spite of strong prevention efforts and good local cooperation. On a bad fire year, these man-caused fires in the lower country are the ones most likely to burn the country out.

The timbered areas of Gallatin County are extensive. A major zone supporting many important timber stands begins in the foothills south of Bozeman and extends southward for nearly seventy-five miles to the Continental Divide. This is a steep, high, mountainous country with few agricultural developments. The ownership of the land base is mostly governmental and nearly all Government lands within this area are under National Forest or National Park jurisdiction.

Another important timbered area in Gallatin County is the relatively small sharp mountain range between the Shields River and Dry Creek. This range is known as the Bridger Mountains. The timber stands on the Bridger Range are not as extensive or as accessible as are those south of Bozeman. The land ownership is more evenly divided between National Forest and private ranching interests.

During the first part of the twentieth century, and for some years before that, the timbered areas of the county were in demand for lumber and railroad ties. This was the period of railway development and rapid settlement of agricultural lands. Timber products of all kinds were in heavy demand locally and many thousands of acres were cut over. When transportation routes were connected with the west coast and lumbering began to flourish in the superior timber stands of that area, the demand on local products declined sharply.

At the time of the first world war and for some years thereafter, another surge of cutting occurred in the West Yellowstone area. The product in demand at the time was again railroad ties. This cutting fell off in the late '20's. Some local manufacture of lumber and the local needs of ranchers for fuel, houselogs, poles, and fencing material has remained constant through the years since settlement of the agricultural valleys.

In very recent years changing market conditions have again created a new demand for timber products—transmission line poles and pulpwood. For the most part, timber cutting in Gallatin County has fluctuated widely as markets varied. The most stable use has been for products of local use for farm and ranch development. This local use has never been large enough to remove the annual growth potential of the timber stands.

Trees of commercial importance in the county are lead by the commonly known Lodgepole Pine. This species is a prolific seed producer and nearly always establishes itself quickly on burned or logged off areas. It is the most important tree in the county from an economic point of view. It is used extensively for telephone poles, transmission line poles, pulpwood, and lumber. The younger trees are used for fencing poles and houselogs.

Douglas Fir is the second most important species in the area because it grows to large dimensions and provides the local mills with a supply of logs suitable for planking and other construction lumber. Of lesser importance are Spruce trees which grow only in the more moist locations. Juniper or Red Cedar grows to commercial size for fence posts on the drier slopes and are in demand by ranchers because of their durability.

The forested areas of the county are found where moisture is more abundant and conditions are favorable for their perpetuation. These mountainous, timbered areas are the sources of the streams of the county. They furnish desirable recreation areas and provide summer ranges for livestock and game. Forested areas of the county are characterized by fairly dense commercial stands on the better mountain soils. These are interspersed with grassy parks and rocky outcroppings. This condition lends contrast to the scenery and enhances its value for game habitat and recreation.

Since most of timbered mountainous areas are publicly owned and under National Forest administration, their management is of vital importance to the economy of the county. Forest Service management is based upon the principals of multiple and sustained use of all areas. This means that all types of use such as a water supply, grazing, timber harvesting, recreation and wildlife must be fully considered and adequate provision made to protect and perpetuate each one.

Timber harvesting is very important in the local economy and cutting is allowed to the limit to which the cutting can be replaced by new growth. Grazing of domestic stock and big game is justified insofar as forage and other soil-holding cover is not deteriorated. Recreational uses by the general public are encouraged and insofar as possible, unrestricted. Some restricted and carefully regulated personal and commercial recreational uses, such as summer homes and resorts, are also permitted.

The land ownership pattern on the Gallatin Forest is complicated because railroad and other private lands are profusely intermingled with public lands. This is a difficult situation which increases the cost of forest administration and renders it somewhat less effective. This complexity is especially troublesome in range management. It does not, however, have a serious affect on over-all land use because cooperation between landowners, permittees and Forest Service is good and public ownership exerts a favorable influence on intermingled private ownerships.

Wildlife populations on the Gallatin National Forest are generally on the increase. One exception to this is a slight reduction in over-all numbers of elk in the Gallatin Elk Herd.

Recent wildlife population estimates, made by District Rangers in cooperation with the Montana State Fish and Game Department, places game numbers on the National Forest in Gallatin County approximately as follows: 300 Black bear, 35 Grizzly bear, 2,500 Mule deer, 2,000 Elk, 350 Moose, 10 Mountain goat, and 100 Bighorn sheep.

Excellent fishing waters abound on the National Forest in Gallatin County. Both lake and stream fishing are well represented and many people from all over the United States come here to enjoy this sport. Estimates show that 17,000 hunters and 32,000 fishermen practiced their skills on National Forest lands in Gallatin County last year. From these figures it is quite evident that wildlife and wildlife habitat on public lands in Gallatin County represent a tremendous resource, not only to the residents of Gallatin County, but to the State of Montana and to the Nation.

The grazing of domestic livestock on the Gallatin Forest in Gallatin County is an important use from the standpoint of the economics of the local community. Both cattle and sheep are permitted in considerable numbers on National Forest land. The following figures of livestock grazed on the National Forest in Gallatin County are the best estimates obtainable because many of the grazing allotments overlap into both Madison and Park counties. Approximately 2,300 head of cattle and 17,000 head of sheep graze on the National Forest in Gallatin County. These figures do not include calves under six months of age or lambs. These young animals are permitted free of charge and not counted. Range management on the National Forests is geared to the protection of watershed values, values which are plainly evident to the residents of Gallatin County.

Annual inspection of livestock ranges are made by forest officers accompanied by grazing permittees whenever available. These inspections are made primarily to discover and correct any "sore spots" caused by overgrazing, excessive trampling, or unauthorized use. Denuded areas, if allowed to develop unchecked, will ultimately result in accelerated soil erosion which presages a ruined watershed.

Range inspections also contribute greatly to the most efficient use of public grazing land where every effort is made to maintain and, if possible, increase the livestock carrying capacity without significant damage to the soil. Conditions on forest ranges in Gallatin County for both game and livestock are generally very good although some small overgrazed spots do exist. The total acreage in this class is, however, extremely small and steadily decreasing.

Development and maintenance of suitable recreation facilities on National Forest lands in Gallatin County is another important responsibility. There are 26 improved campgrounds and picnic areas with tables, benches, grills, and sanitary facilities free to the public on the choicest National Forest sites in the county. These grounds are developed to accommodate 150 family units or a combined total of one thousand people. They are maintained to the best standard possible under existing financial allotments.

On these public lands 151 summer homes, 6 resorts and 2 organization camps have been constructed under special-use permit. Permits are also in effect for 5 barns, 15 pastures, 26 water transmission systems, 6 power transmission lines, 3 dams and water storage reservoirs, 3 state fish spawn collecting stations, and 2 winter sports areas.

To administer the public resource on National Forest lands in Gallatin County, workers must have means of travel and communication. For this reason the Government has constructed 80 units of forest highway, 169 miles of forest road, 605 miles of trail and stock driveway and 86 miles of telephone line. Excepting the highways, which after construction are maintained by the State Highway Department, all facilities are maintained with Government funds. While not their primary purpose, these roads and trails serve the public when for any reason it is desirable to travel through the National Forest.

Forest Service objectives are to use for public benefits all of the resources of the National Forests to the fullest extent possible but in so doing to: (1) Maintain and increase watershed efficiency through supervised logging and grazing and through control of fire and erosion, (2) Maintain and improve livestock ranges and timber stands, (3) Protect wildlife and perpetuate its habitat, (4) Safeguard suitable and appropriate recreation sites so that recreation facilities may some day be developed to a level commensurate with the need. The overall aim is to attain integrated multiple use of all forest resources on the basis of sustained yield for all time.

SUMMARY OF IRRIGATED LAND BY RIVER BASINS IN THE FOLLOWING COUNTIES COMPLETED TO DATE

Big Horn, Carbon, Custer, Gallatin, Golden Valley, Meagher, Musselshell, Park, Rosebud, Stillwater, Sweet Grass, Treasure, Wheatland, and Yellowstone

RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
MISSOURI RIVER DRAINAGE BASIN			
***Missouri River**	4,126	1,512	5,638
Jefferson River	6,127	2,190	8,317
Madison River	7,984	1,537	9,521
Gallatin River	2,734	1,126	3,860
West Gallatin River	84,538	9,463	94,001
East Gallatin River	24,073	10,483	34,556
Smith River	30,304	18,398	48,702
Musselshell River	64,789	57,870	122,659
TOTAL	224,675	102,579	327,254
YELLOWSTONE RIVER DRAINAGE BASIN			
Yellowstone River	223,406	52,550	275,956
Shields River	33,260	8,556	41,816
Big Timber Creek	10,378	9,234	19,612
Boulder River	13,415	2,742	16,157
Sweet Grass Creek	18,594	23,006	41,600
Stillwater River	11,661	3,459	15,120
Rosebud River	15,828	12,944	28,772
Clarks Fork River	33,286	7,328	40,614
Rock Creek	58,482	16,867	75,349
Big Horn River	48,261	15,735	63,996
Little Big Horn River	17,134	9,844	26,978
Tongue River	22,137	7,479	29,616
Powder River	8,264	1,804	10,068
Grand Total Yellowstone River Basin	514,106	171,548	685,654
Grand Total Missouri River Basin	224,675	102,579	327,254
Grand Total in the Counties Complete to date	738,781	274,127	1,012,908

It was necessary to cover 14,029,475 gross acres in the above basins in order to complete the survey.

* Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF GALLATIN COUNTY BY RIVER BASINS

REGULAR IRRIGATION—Missouri River Basin	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
***Missouri River**	30	90	120
Jefferson River	2,191	1,413	3,604
Antelope Creek	118	0	118
Sappington Spring	111	0	111
Hankinson Spring	5	0	5
Seepage and Waste	10	0	10
Willow Creek	3,615.2	750.6	4,365.8
Wells	77	26	103
Madison River	6,537	713	7,250
Grayling Creek	336	458	794
South Fork of Madison River	0	0	0
Dwelle Creek	93	0	93
Zimmerman Spring	56	0	56
Watkins Creek	63	121	184
Elk Creek	214	100	314
Gallatin River	332	80	412
West Gallatin River	72,433.5	8,240	80.673.5
Snowflake or White Springs	13	0	13
Sage Creek	20	0	20
Taylors Fork or Dodge Creek	13	132	145
Cinnamon Creek	6	0	6
Buck Creek	19	0	19
Unnamed Spring	19	0	19
Beaver Creek	120	0	120
Porcupine Creek	196	0	196
West Fork	0	0	0
North Fork of West Fork	297	0	297
Dudley Creek	23	0	23
Mike Creek	41	0	41
Hell Roaring Creek	65	0	65
Logger Creek	2	0	2
Lime Creek	15	0	15
Spanish Creek	75	90	165
South Fork of Spanish Creek	445	0	445
Twin Creeks	37	0	37
Stone Quarry Creek	10	0	10
Browns Gulch	10	0	10
Wilson Creek	793	305	1,098
Bear Creek	1,553	25	1,578
Unnamed Spring	0	30	30

* Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF GALLATIN COUNTY BY RIVER BASINS

(Missouri River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Wortman Creek	35	0	35
South Cottonwood Creek	4,315	135	4,450
Unnamed Slough	78	0	78
Unnamed Spring	65	0	65
Spring Creek	75	50	125
Maryott Creek	0	95	95
Fish Creek	96	0	96
Godfrey Canyon Creek	37	0	37
Knox Creek	56	0	56
Ridgley Creek	453	144	597
Baker Creek	424	61	485
Trout or Spring Creek	38	0	38
Warm Springs Creek	1,437.75	114	1,551.75
Camp Creek	1,083	32	1,115
Randall Creek	35	0	35
Slough	0	10	10
East Gallatin River	3,424	2,466	5,890
Rocky (Canyon) Creek	168	46	214
Tunnel Creek	30	0	30
Jackson or Middle Creek	172	205	377
Marble Creek	70	15	85
Meadow Creek	0	0	0
Hodson Creek	0	60	60
Pitcher or Solin Creek	9	0	9
Bear Creek	363	60	423
Unnamed Spring	10	0	10
Kelly Creek	52	0	52
Little Bridger Creek	4	0	4
Spring Creek	15	0	15
Bozeman Creek	2,287.5	443	2,730.5
Limestone or Limekiln Creek	95	11	106
Nash Spring Creek	0	0	0
Leverich Creek	20	0	20
Nichols Creek	35	0	35
Unnamed Spring Creek	235	73	308
Bird Spring Creek	104	0	104
Slough	200	0	200
Bridger Creek	446.4	314	760.4
Maynard Creek	20	0	20
Unnamed Spring	44	0	44
White Creek	0	65	65
Pine or Perkins Creek	100	99	199
Stone Creek	95	0	95
School Gulch or Luce Creek	0	258	258

IRRIGATION SUMMARY OF GALLATIN COUNTY BY RIVER BASINS

(Missouri River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Spring or Proffit Creek	394	145	539
Unnamed Spring	0	7	7
Grouse Canyon Creek	45	0	45
Day Creek	3.5	0	3.5
Beasley Creek	104	0	104
Drain Ditch	35	0	35
Unnamed Spring	6	0	6
Whittman Creek	27.2	7.7	34.9
Place Creek	9.9	4	13.9
Unnamed Creek	2	0	2
Stubblefield Creek	65	0	65
Unnamed Spring Creek	1	0	1
Lyman Creek	5	0	5
Deer Creek	0	15	15
Unnamed Spring Creek	26	0	26
North Cottonwood Creek	22	619	641
Watts Creek	5	0	5
Schafer Canyon Creek	75	0	75
Bostwick Creek	53	754	807
Unnamed Spring Creek	603	155	758
Middle or Hyalite Creek	9,458	187	9,645
Unnamed Spring	37	0	37
Johnson Creek	37	5	42
Unnamed Spring	20	0	20
Unnamed Spring Creek	53	0	53
Elk Grove Slough	40	100	140
Dry Creek	236	0	236
John Fuller Ranch Spring	22	0	22
Waste Water	89	0	89
Unnamed Creek	276	0	276
Benhart or Spring Creek	50	0	50
Smith Creek	156	15	171
Trout Creek	38	245	283
Ross Creek	1,561	1,370	2,931
Jones Creek	0	22	22
Truman Creek	55	56	111
Dry Fork Creek	0	31	31
Waste Water	37	10	47
Reese Creek	379	334	713
Tom Reese Creek	233	0	233
Corbley Creek	265	39	304
Bill Smith Creek	98	44	142
North Cottonwood Creek	189	78	267
Hayes Creek	0	251	251

IRRIGATION SUMMARY OF GALLATIN COUNTY BY RIVER BASINS

(Missouri River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Bear Creek	53	60	113
Dry Creek	563	215	778
LaRue or Stant Creek	15	184	199
Unnamed Creek	5	15	20
Pass Creek	261	441	702
Johnson Canyon Creek	0	72	72
Gallop Creek	10	0	10
Nelsons Swamp	4	0	4
Beaver Creek	0	23	23
Mill Canyon Creek	66	72	138
Quaggle Creek	15	5	20
Reynolds Creek	0	73	73
Unnamed Spring	0	15	15
Story Creek	408	242	650
Cowan Creek	130	60	190
Gibson Creek	511	0	511
Bull Run Creek	577	88	665
Unnamed Springs	52	5	57
Waste Water	147	0	147
Stevens and Dunbar Springs	0	64	64
Rea (Moss) Creek	576	521	1,097
Bonnie Brook Creek	1	0	1
Hot Springs Creek	0	66	66
Sixteen Mile Creek	152	49	201
Lost Creek	11	0	11
East Meadow Creek	0	0	0
Basin Creek	54	0	54
Middle Fork of Sixteen Mile Creek	34	14	48
South Fork of Sixteen Mile Creek	123	49	172
Brenner Creek	8.5	20	28.5
Total in Missouri River Basin	124,807.45	24,176.30	148,983.75

REGULAR IRRIGATION—Yellowstone River Basin

Yellowstone River	0	0	0
Tom Miner Creek	0	0	0
Sunlight Creek	0	0	0
Trail Creek	49	0	49
Shields River	0	0	0
Flathead Creek	345	0	345
North Fork of Flathead Creek	827	61	888
Dixon Creek	20	0	20
Frazier Creek	380	435	815

IRRIGATION SUMMARY OF GALLATIN COUNTY BY RIVER BASINS

(Yellowstone River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
McDonald Creek	0	40	40
South Fork of Flathead Creek	294	435	729
Fairy Creek	696	105	801
Miller Creek	0	37	37
Middle Fork of Flathead or Corral Creek	824	95	919
Spring Creek	38	22	60
Green Canyon Creek	141	218	359
Little Muddy Creek	190	180	370
Mud Creek	40	0	40
Jackies Creek	0	0	0
Willow Spring	10	30	40
Big Muddy Creek	0	6	6
Brackett Creek	81	0	81
Horse Creek	22	0	22
Skunk Creek	10	5	15
Nixon Creek	35	2	37
Total in Yellowstone River Basin (Regular)	4,002.00	1,671.00	5,673.00
GRAND TOTAL REGULAR IRRIGATION	128,809.45	25,847.30	154,656.75
FLOOD IRRIGATION—Missouri River Basin			
Missouri River	0	0	0
Madison River	0	0	0
South Fork of Madison River	0	0	0
East Fork of Cream Creek or Pulsifer Creek	15	119	134
Dwelle Creek	2	0	2
Denny Creek	521	15	536
Lonesome Spring	114	0	114
Zimmerman Spring	15	0	15
Unnamed Springs	18	0	18
Elk Creek	0	11	11
Gallatin River	0	0	0
West Gallatin River	0	0	0
Monument Creek	10	0	10
Buffalo Horn Creek	52	0	52
Twin Cabin Creek	15	0	15
Beaver Creek	18	0	18
South Cottonwood Creek	0	0	0
Unnamed Spring	10	0	10
East Gallatin River	0	0	0
Rocky (Canyon) Creek	0	0	0
Spring Creek	17	0	17
Bozeman Creek	0	0	0

IRRIGATION SUMMARY OF GALLATIN COUNTY BY RIVER BASINS

(Missouri River)—Continued	**Present Irrigated Acres**	**Irrigable Acres Under Present Facilities**	**Maximum Irrigable Acres**
Slough and Swamp	0	31	31
West College Spring	10	0	10
Bridger Creek	0	0	0
Unnamed Spring	0	8	8
Unnamed Spring Creek	4	0	4
Lyman Creek	0	54	54
Westlake Spring Creek	5	0	5
Churn Creek	75	120	195
Middle or Hyalite Creek	0	0	0
Unnamed Springs	0	10	10
Smith Creek	0	0	0
Ross Creek	2	0	2
Reese Creek	0	0	0
Corbley Creek	0	180	180
Limestone Creek	0	39	39
North Cottonwood Creek	45	150	195
Dry Creek	0	0	0
Pass Creek	75	8	83
Beaver Creek	21	55	76
Mill Canyon Creek	18	44	62
Sixteen Mile Creek	0	0	0
Lost Creek	0	0	0
Elk Creek	20	0	20
Sheep Creek	19	0	19
East Meadow Creek	0	0	0
Basin Creek	18	0	18
Total Missouri River Basin (Flood)	1,119	844	1,963
FLOOD IRRIGATION—Yellowstone River Basin			
Yellowstone River	0	0	0
Shields River	0	0	0
Little Cottonwood Creek	0	0	0
Wallrock or Basin Creek	10	35	45
Flathead Creek	0	0	0
South Fork of Flathead Creek	10	0	10
Little Muddy Creek	35	0	35
Total Yellowstone River Basin (Flood)	55	35	90
Grand Total of Regular and Flood Irrigation (Missouri and Yellowstone River Basins) in Gallatin County	129,843.45	26,581.30	156,424.75

BAKER DITCH COMPANY

In 1898 water was appropriated from Baker Creek and Warm Springs Creek and transported by a ditch to land then owned by H. E. Baker, Oliver Scow, Elmer W. Parker, and Harry J. Thomas. A few years later the ditch was extended to the West Gallatin River and water was appropriated for irrigating additional land.

In 1909 when the West Gallatin River and tributaries were decreed in Case No. 3850, H. E. Baker was decreed 129 miner's inches of water, appropriated October 29, 1898; Elmer Parkin, 44 miner's inches appropriated October 29, 1898; Oliver Scow, 40 miner's inches appropriated June 20, 1895, and 43 miner's inches appropriated October 29, 1898; and Harry J. Thomas, 137.6 miner's inches appropriated October 29, 1898.

On July 20, 1914, a subsequent decree, Case No. 4706, decreed the Baker Ditch Company 1,606.4 miner's inches of West Gallatin River water that had been appropriated October 15, 1912.

The Baker Ditch Company was organized July 9, 1913, when Articles of Incorporation were filed, capitalizing for $40,000, this being divided into 2,000 shares at $20.00 per share par value, one share equivalent to one miner's inch of water.

Stock in the company was fully subscribed with the decreed water of H. E. Baker, Oliver Scow, Elmer W. Parker, and Harry J. Thomas, listed as preferred stock, while the water decreed to the ditch company appropriated October 15, 1912, was listed as common stock.

On July 12, 1933, a certificate of extension of corporate existence was filed, extending the term of existence for forty years. At present there are thirteen stockholders in the corporation, seven of them holding the preferred stock with six stockholders having common stock.

The Baker Ditch diverts water from the West Gallatin River at a point on the west bank near the center of Section 19, Township 1 North, Range 4 East, just south of the town of Central Park. The ditch extends in a northwest direction along the south side of the Northern Pacific Railway tracks and flows into Baker Creek. A diversion ditch takes the water from Baker Creek and continues along the railroad tracks for a short distance. At this point the ditch goes under the tracks and extends along the north side until it flows into Warm Springs Creek. Another diversion ditch takes the water from Warm Springs Creek and then extends in a northwest direction past the town of Manhattan to its termination in Section 31, Township 2 North, Range 3 East. In all, the ditch is approximately 12 miles in length.

A sufficient amount of water is available in the ditch, with the exception of a few days when the river commissioner turns water into ditches upstream on the West Gallatin River. Although the West Gallatin River rights on this ditch are of a late priority no shortage exists since the water used is all return flow from the upstream ditches and a few days have to elapse for the return flow to reach the headgate of the Baker Ditch.

During the last 10 years operation and maintenance charges have averaged 50 cents for each share of stock owned in the company.

In 1952, 1,332 acres were irrigated by the Baker Ditch and 98 acres considered as potentially irrigable under the system.

(See Map in Part II, Pages 4 and 11)

BOZEMAN CREEK RESERVOIR COMPANY

The Bozeman Reservoir Company was first incorporated on March 11, 1901, for a period of 20 years. Purposes of this corporation were to appropriate and use for irrigation, waters from Mystic Lake and Bozeman Creek. On September 13, 1901, the company filed on 3,000 miners inches of flood water from Bozeman Creek and Mystic Lake. A dam was then built of rock, stone, and other suitable materials across Bozeman Creek at the point where the creek flows from and forms the outlet of Mystic Lake. These flood waters so dammed, reservoired, and appropriated were run down the natural channel of Bozeman Creek to points where ditches diverted and conveyed the water to farms and other places of intended use. This company continued operations under the provisions set forth in the Articles of Incorporation until its term of existence expired on March 11, 1921.

On June 27, 1922, a new corporation of the same name was formed to succeed the defunct "Bozeman Reservoir Company." All property, rights, titles and interests owned by the former "Bozeman Reservoir Company" were acquired by the new corporation. Most important of the changes in the provisions of the new corporation were: "That the water appropriated may be used upon the lands of the stockholders in the corporation for irrigation, culinary, domestic, power, and other useful and beneficial purposes to the extent required by them; and in proportion to their respective shares and interest in the company; and for a water supply for the City of Bozeman, Montana, and the inhabitants thereof, in proportion as the shares and interests of the City of Bozeman appears or shall appear in said Company."

The Bozeman Reservoir Company is incorporated for a period of forty (40) years. Stock issued by the company amounts to 60 shares having a par value of $500 each. The total amount of stock actually subscribed to is 20 shares. The stock in the corporation is assessable.

A regular assessment of $25.00 per share of stock is made each year. Operation and maintenance charges have averaged about $20.00 per share for the last several years. One share of stock entitles each stockholder to the use of 100 miner's inches of water a day for a total of 14 days during the irrigation season or 50 miner's inches a day for a total of 28 days.

Largest stockholder in the corporation at the present time is the City of Bozeman, whose 6 shares are used to supply water for domestic use in the city of Bozeman. The other 14 shares (of 20 subscribed to) are owned by nine farmers in the company, being divided as follows: six having 1 share; one owning 2 shares; and the other two having 3 shares each. The water represented by the latter shares is used for irrigation on farm lands south of Bozeman. This water is diverted from Bozeman Creek and carried in the following irrigation ditches: Mystic Lake, "68", "66", and the Lower Williams.

In 1952, 437 acres of land were irrigated or supplied supplemental water from the Bozeman Reservoir Company.

(See map in Part II, Pages 38, and 42).

DRY CREEK IRRIGATION COMPANY

Prior to the organization of the Dry Creek Irrigation Company several land owners located in the Lower Dry Creek Valley, between Reynolds Creek and the East Gallatin, had

no means of irrigation because the early water rights were held by farmers at the lower end of the valley near the East Gallatin River. To acquire the early water rights on Dry Creek the upstream land owners agreed to build an irrigation canal for the farm owners in the lower valley along the East Gallatin in exchange for these rights. The Dry Creek Canal's water supply from the East Gallatin River and Smith Creek was secured, since water rights from these streams were held by farmers under the proposed canal.

To accomplish this agreement the Dry Creek Irrigation Company was incorporated on April 9, 1907, and capitalized for $12,500 divided into 1,250 shares valued at $10.00 per share par value. Each share of stock was equal to one miner's inch of water. On March 24, 1909, water rights in the amount of 1,250 miner's inches were deeded to the Dry Creek Irrigation Company. These water rights acquired by the company are all, or a part, of several appropriations in which the deed record did not clearly define any further than owner and the amount of water. These rights are as follows: From Smith Creek: John A. Moore, 100 miner's inches; S. J. Miller, 50 miner's inches; W. H. Cox, 100 miner's inches; J. S. Ballard, 100 miner's inches; G. D. Tribble, 50 miner's inches; W. M. Cowan, 100 miner's inches. From the East Gallatin River: Harvey LaRue, 50 miner's inches; L. P. Miller, 87 miner's inches; Sam P. Miller, 29 miner's inches; Will V. Callantine, 58 miner's inches; M. J. Craver, 58 miner's inches; W. T. Yadon, 58 miner's inches; Peter Stevens, 50 miner's inches; Robert Jones, 50 miner's inches; H. W. Ray, 15 miner's inches; Rebecca A. Moore, 45 miner's inches; Kate Cowan, 150 miner's inches; and William Durham, 100 miner's inches.

On June 3, 1932, new Articles of Incorporation were filed with a capital of $15,000 divided into 1,500 shares at $10.00 per share. Subscriptions issued to date amount to 1,300 shares which are equal to 1,300 miner's inches of water. This amount is 50 miner's inches in excess of the water rights deeded to the company. However, the company has established a use right for this additional water and intends to make filings accordingly.

The Dry Creek Canal diverts water from the East Gallatin River at a point on the north bank in the southeast quarter of Section 18, Township 1 North, Range 5 East. It flows in a northerly direction and into Smith Creek; it is then diverted from Smith Creek and flows northwesterly into Reese Creek; and thence diverted from Reese Creek and flows northwesterly, finally returning to the East Gallatin River in the Southwest Quarter of Section 29, Township 2 North, Range 4 East.

Water charges vary each year depending upon the requirements of the system. Assessments for operation and maintenance are levied in proportion to the shares owned in the company. The canal diverts water several miles below the critical area of the East Gallatin River and the return flow to the river eliminates any water shortage problem for the canal system.

In 1952, 1,368 acres of land were irrigated from the Dry Creek Canal with no acres potentially irrigable under the canal system.

(See Map in Part II, Pages 5, 6, and 12)

FARMERS CANAL COMPANY

On October 6, 1890, an appropriation was filed for 5,000 miner's inches of water from the West Gallatin River by the Excelsior Canal Company, an organization that was formed

in 1889. Three years after the creation of the Canal, on December 23, 1892, Articles of Incorporation were filed forming the Farmers Canal Company, claiming all the property and interests of Excelsior Canal.

The Farmers Canal was capitalized for $50,000 divided into 100 shares at $500 per share with $2,800 of the capital stock subscribed. In 1903 the capitalization was increased to $55,000 divided into 110 shares at $500 per share.

In 1909, the West Gallatin River Decree, Case No. 3850, Farmers Canal was decreed 40 miner's inches of water appropriated June 15, 1883; 750 miner's inches appropriated July 1, 1890; 5,000 miner's inches appropriated September 29, 1890; 3,000 miner's inches appropriated June 15, 1891; and 1,820 miner's inches appropriated April 2, 1892.

New Articles of Incorporation were filed October 31, 1923, for a period of 40 years with the same capitalization of $55,000 divided into 110 shares at $500 per share par value. Each share of stock represented 97½ miner's inches of water and all of the stock was fully subscribed.

The water rights decreed to the company are of a late priority date, therefore, this "company water" is available only during the high water period of the West Gallatin River. The river usually recedes to its normal flow early in the month of July and at that time the company rights become invalid.

There are, however, several individual decreed rights carried in the canal after the company water has been shut off. These rights are as follows: H. S. Buell, 55 miner's inches of 1867 priority, transferred from the Allison-Lewis Ditch; Gallatin Ranch Company, 301 miner's inches of 1866 priority, and John Robinson, 100 miner's inches of 1865 priority transferred from the Creamery Ditch; Frank Jakle, 90 miner's inches of 1870 priority, and S. M. McKennon, 88 miner's inches of 1865 priority transferred from the Lewis Ditch; Daniel P. Cloninger, 100 miner's inches of 1872 priority, Christopher Waterman, 95 miner's inches of 1872 priority, and Peter Emmel, 90 miner's inches of 1872 priority transferred from the Lower Middle Creek Supply Ditch; Lumyra Tudor, 59 miner's inches of 1883 priority tranferred from the Neibel-Tudor Ditch; A. D. Weaver, 117 miner's inches of 1866 priority, Leonard Stone, 82 miner's inches of 1866 priority, and D. P. Stone, 80 miner's inches of 1881 priority, transferred from the Stone-Weaver Ditch; Jacob B. Weaver, 100 miner's inches of 1887 priority, transferred from the J. B. Weaver Ditch; and O. L. Ward, 110 miner's inches of 1890 priority.

In addition to the above rights three water users are buying 275 acre-feet of water from the Middle Creek Storage Project that is carried in the Farmers Canal.

Water assessments are determined by the number of shares of stock owned by each stockholder in the company and the water charges have never exceeded 6% of the par value of each share of stock. In 1951 operation and maintenance charges amounted to 30 cents for each acre of irrigated land.

The Farmers Canal diverts water from the east bank of the West Gallatin River at a point in the NW¼ of Section 11, Township 3 South, Range 4 East, and extends in a northeasterly direction approximately eleven miles, terminating just west and north of the Bozeman city limits.

In 1952 11,380 acres of land were irrigated under the Farmers Canal with 541 acres potentially irrigable under existing facilities.

(See Map in Part II, Pages 31, 36, 37, 38, and 40).

HIGH LINE CANAL COMPANY

Sec. Treasurer (1980) "Jack" Gates Wastes Ins. Co. - Box

The West Gallatin Irrigation Company was incorporated on October 9, 1889, for a period of 20 years. On October 2, 1909 the company extended its charter another 20 years, until 1929. During the first few years of the company's existence only one main canal served the farmers under the system. It soon became apparent that because of the length, capacity and location, etc., the canal would be unable to provide an adequate water supply to all the lands under the irrigation system. Another diversion point was located on the West Gallatin River and a new canal constructed to supply water to the farms at the lower end of the project. The original canal became known as the High Line, and the lower canal was named the Low Line. For several years both canals operated under the West Gallatin Irrigation Company. In 1924 the Low Line withdrew from the company and formed its own corporation.

Four months after the expiration of its charter, on February 21, 1930, the West Gallatin Irrigation Company changed its name and incorporated as the High Line Canal Company. The capital stock of the corporation amounted to $150,000 and was divided into 7,500 shares, with a par value of $20.00 each. The term of existence was for forty years from and after the date of its incorporation.

At the present time stock subscribed to in the company amounts to 5,189 shares and is assessed each year at $1.00 per share, with one share being equivalent to one miner's inch of water.

Water rights decreed to the West Gallatin Irrigation Company in the West Gallatin Decree, Case No. 3850, and acquired by the High Line Canal Company are:

(1) 3,400 miner's inches appropriated May 9, 1890.

(2) 3,400 miner's inches appropriated June 1, 1901.

Also a water right decreed to the High Line Canal Company, Supplemental Decree Case No. 4786, of 700 miner's inches appropriated June 1, 1913.

Due to the late dates of priority the water rights of the High Line Canal should be considered as only "flood rights," since water supplied to this canal has been shut-off on July 1st and not later than July 15th each year.

In 1952 there were 8,289 acres irrigated with 1,844 acres potentially irrigable under the canal, or a maximum irrigable acreage of 10,133 acres under the High Line Canal.

(See Map, Part II, Pages 29, 30, 35, and 36).

HOFFMAN-WEAVER DITCH COMPANY

The J. S. Hoffman and J. B. Weaver ditches were first used for irrigation purposes in the late 1880's. At that time they were separate ditches, running parallel for a distance of

one-half mile. Due to the headgate diversions being too close to each other they were combined with a common headgate and ditch for one-quarter of a mile to a point where the individual ditches diverge.

Articles of Incorporation were filed on February 25, 1925, for a period of 40 years from the date of incorporation. This corporation was capitalized for $25,000, divided into 2,500 shares at $10.00 per share, each share being equivalent to one miner's inch of water. Subscriptions pledged in the Articles of Incorporation were 1,801 shares and amounted to $18,010.

Terms of the corporation were to acquire, in exchange for capital stock in the company, all main ditch rights and all rights to the water from the West Gallatin River decreed to water users under the Hoffman-Weaver Ditch in the West Gallatin Decree, Case No. 3850.

These water rights are listed as follows: In the J. B. Weaver Ditch: J. B. Weaver, 394 miner's inches appropriated June 15, 1887; F. W. Heinrichs, 371 miner's inches appropriated June 15, 1887; Willard Knadler, 132 miner's inches appropriated June 15, 1887; F. R. Merkel, 386 miner's inches appropriated May 15, 1888; and F. R. Merkel, 90 miner's inches appropriated July 20, 1891. Totaling 1,373 miner's inches of water listed by the incorporation as belonging to the Weaver Ditch.

In the J. S. Hoffman Ditch: J. S. Hoffman, 223 miner's inches appropriated June 15, 1888; George Dietsch, 186 miner's inches appropriated June 15, 1888; W. D. Brock, 237 miner's inches appropriated May 15, 1888; Nicholas Sheplar, 52 miner's inches appropriated July 1, 1887; Mary and Emily Sheplar, 71 miner's inches appropriated April 15, 1868; and Ben Creasy, 26 miner's inches appropriated June 12, 1889. Totaling 795 miner's inches of water listed by the incorporation in the Hoffman Ditch.

Several changes have occurred in the listings of the above water rights from the date of incorporation. These changes are: Transferred out of the Weaver Ditch, 100 miner's inches of the F. R. Merkel right dated June 15, 1888, and divided as follows: 50 miner's inches to the Durham Ditch and 50 miner's inches to the White Ditch. Also 100 miner's inches of the J. B. Weaver right dated June 15, 1887, is carried in the Farmers Canal. One right of 52 miner's inches decreed to F. R. Merkel and dated July 20, 1891, was transferred into the Weaver Ditch from the Durham Ditch. Taking into account all the changes a total of 1,225 miner's inches of water is now conveyed through the Weaver Ditch. The total amount of water carried by the Hoffman Ditch remains the same, 795 miner's inches.

The Hoffman-Weaver Ditch Company has for many years operated as a mutual ditch. Although the company charter will not expire until the year 1965 to date no record has been found where the company ever dissolved. Operation and maintenance charges under this mutual ditch system has been equally divided among all the water users.

The point of diversion for the ditch is from the east bank of the West Gallatin River in the N½ of Section 22, Township 1 South, Range 4 East, following in a northerly direction for approximately one-quarter of a mile, then divides. The Hoffman Ditch continues in a northerly direction terminating in Section 27 and 28, Township 1 North, Range 4 East; and the Weaver Ditch follows a southeasterly course ending in Section 26, Township 1 North, Range 4 East.

In 1952 fourteen water users irrigated 1,623 acres of land under the Hoffman-Weaver Ditch, with 333 acres of potentially irrigable land under the system.

(See Map in Part II, Pages 5, and 30).

HOY DITCH COMPANY

4/80 President J.C. Boyd 586-9387 Bozeman

The Hoy Ditch Company filed Articles of Incorporation August 10, 1951. However, the users operated previous to this time as an unincorporated mutual association. The company was organized to operate and maintain a water transporting ditch through which the users convey their own individual water. The Hoy Ditch Company incorporated as a non-profit organization with the number of members limited to those persons having an interest in the lands of which water is diverted for irrigation from the Hoy Ditch. The company does not own or control any water rights. One share of stock in the company is equal to the right to carry twenty-five miner's inches in the ditch. During the year of 1952 operation and maintenance charges amounted to $13.33 per share for every 25 miner's inches of water carried in the ditch.

All water rights carried in the ditch were decreed in the Middle Creek Decree dated March 11, 1897. These rights with their priority dates are as follows: Mary W. Anderson and Edw. Hodgman, 25 miner's inches of 1866 priority; Randolph Brooks, 100 miner's inches of 1869 priority; William Welch, 100 miner's inches of 1870 priority; William Welch, 100 miner's inches of 1872 priority; Charles E. Hoy, 125 miner's inches of 1878 priority; Randolph W. Brooks, 100 miner's inches of 1881 priority; and Charles E. Hoy, 50 miner's inches of 1882 priority. In addition to the above rights nine users are carrying 725 acre feet of stored water in the ditch from the Middle Creek Storage Project and two users carry 150 miner's inches of Middle Creek Ditch Company water. On the basis of prior use the ditch users claim a right to 650 miner's inches of flood water of Middle Creek.

The point of diversion of the Hoy Ditch is from the east bank of Middle, or Hyalite Creek at a point in the center of the NW^1_4 of Section 14, Township 3 South, Range 5 East, then the ditch follows a northerly direction for approximately three miles where it ends, spilling its waste water into the Middle Creek Ditch.

In 1952, 386 acres were irrigated from the Hoy Ditch, with 10 acres potentially irrigable under the ditch system.

(See Map in Part II, Pages 37 and 41).

KUGHEN DITCH COMPANY

In the early part of the decade between 1870 and 1880 David Kughen plowed a ditch from the West Gallatin River to irrigate his land below Shedd's Bridge. As the country below him became settled and more land needed irrigation, each person wanting water, ploughed another furrow beside the Kughen furrow, and past the Kughen furrow to a point where it was to be used. In this manner the ditch became wider and more water was diverted. Each user of the ditch was responsible for maintenance from the end of his land to the head of the ditch. This maintenance policy is still followed by the ditch users under present land ownership.

On March 29, 1909, the users of the ditch filed Articles of Incorporation to cover a period of 20 years. Capital stock of $12,000 was at that time fully subscribed, the stock being divided into sixty shares of $200 per share par value. Of the sixty shares issued 6 shares were listed as preferred stock and were guaranteed water under the oldest rights held by the company, while the other 54 shares were listed as common stock. The original corporation members were D. Cameron, J. B. Corrie, Frank Heiskell, Augustus Johnson, Joseph Johnson, Thomas L. Kirk, David W. Lewis, Matt Neibel, Josie Rowland, and L. G. Young.

On March 22, 1922, a special meeting of the stockholders was called and the Articles of Incorporation were amended to extend the term of its existence for another twenty years. Since that meeting the term has been re-extended and will not expire until March 28, 1982.

Under the West Gallatin Decree, Case No. 3850, the Kughen Ditch Company was decreed water as follows: 328 miner's inches appropriated June 1, 1874; 1,531 miner's inches appropriated August 25, 1882; 60 miner's inches appropriated August 25, 1885; 400 miner's inches appropriated June 1, 1886; 98 miner's inches appropriated June 1, 1889; 96 miner's inches appropriated June 1, 1890; and 300 miner's inches appropriated June 1, 1894, making a total of 2,813 miner's inches decreed to the Kughen Ditch.

The water supply is considered adequate throughout most of the irrigation season with the exception of the rights held by the company of 1886-1894 priority, which are shut-off by July 1 to July 15 each year. There are eighteen stockholders in the company at present, with one share of stock equal to one miner's inch of water.

The Kughen Ditch diverts water from the West Gallatin River in the N½ of the SW¼ of Section 27, Township 2 South, Range 4 East, and flows in a northwesterly direction for approximately five miles.

In 1952 there were 3,345 acres irrigated under this system with 37 acres potentially irrigable under existing facilities.

(See Map in Part II, Pages 29, 30, and 36).

LOW LINE CANAL COMPANY

"1980" See Treasury - "Jack" Gates - Waites Ins Co. Bozeman

The Low Line Canal was first constructed and operated as a part of the West Gallatin Irrigation Company, a corporation formed in 1889. On November 10, 1924, the farmers under this canal severed all connections with the West Gallatin Irrigation Company and formed a separate corporation called the Low Line Canal Company.

Capital stock of the company amounted to $240,000 and was divided into 60,000 shares, having a par value of $40.00. Each share of stock is assessed $1.00 annually, and represents one miner's inch of water. Recent figures list 5,388 shares of stock subscribed to in the company, and is divided among 59 stockholders.

The Low Line Canal is a direct diversion from the West Gallatin River, and follows a generally northwesterly direction. The point of diversion is described as diverting water from the west bank in NW¼SW¼ of Section 23, Township 2 South, Range 4 East.

Water rights owned by the Low Line Canal Company were decreed to the West Gallatin Irrigation Company in West Gallatin Decree, Case No. 3850. These rights are as fol-

lows: 3,400 miner's inches appropriated May 9, 1890; and 1,600 miner's inches appropriated June 1, 1901. Also a water right was decreed to the Low Line Canal in a Supplemental Decree, Case No. 6751, of 2,500 miner's inches apporpriated June 1, 1913.

This canal company has a shortage of water due to the late dates of priority of the above mentioned rights. Therefore, these rights are considered "flood rights," since the water is shut-off by July 15 and sometimes as early as July 1st each year.

In 1952, 7,783 acres were irrigated with 646 acres potentially irrigable under existing facilities, making a maximum acreage of 8,429 acres under the Low Line Canal.

(See Map, Part II, Pages 4, 29, and 30).

MAMMOTH DITCH COMPANY

The first incorporation of the Mammoth Ditch Company was on May 17, 1904. However, it should be pointed out that the ditch was used in 1866, 38 years before its date of incorporation and is probably one of the oldest ditches in the Gallatin Valley. Among the earliest water users under the ditch were Charles H. Waterman, C. H. McDonald, and Frank L. Benepe.

On February 16, 1927, the Mammoth Ditch Company re-incorporated for 40 years with a capital stock of $26,000 which was divided into 52 shares having a par value of $500.00. All 52 shares of stock issued are subscribed to and divided under the ditch system among fourteen farmers. The stock of the company was made assessable in certain amounts and at such times as prescribed in the by-laws by order of the trustees of the corporation. Annual assessments for operation and maintenance have averaged $10.00 per share for the last ten years. One share of stock is equivalent to 50 miner's inches.

The point of diversion of the main ditch is: A point on the east bank of the West Gallatin River in SW¼SW¼ of Section 2, Township 2 South, Range 4 East.

Two water rights were decreed to the Mammoth Ditch Company from the West Gallatin River in Case No. 3850: W. D. Bell, Jr., et al, Plaintiffs vs. F. K. Armstrong, et al, Defendants, dated October 7, 1909.

(1) 2,361 miner's inches, or a flow equivalent to 59.02 cubic feet per second, appropriated June 1, 1866.

(2) 579 miner's inches, or a flow equivalent to 14.47 cubic feet per second, appropriated May 31, 1884.

These rights are on file in Judgment Book 9, Page 288, in the office of the Clerk of the District Court of Gallatin County.

In 1952 there were 2,854 acres irrigated under the Mammoth Ditch with 122 acres potentially irrigable, making a maximum of 2,976 acres under existing ditch facilities.

(See Map, Part II, Pages 5, 6, 30, and 31).

MIDDLE CREEK DITCH COMPANY

On March 20, 1886, Articles of Incorporation were drawn up and recorded with the County Clerk and Recorder of Gallatin County for this ditch company as a matter of record and as stated in the Articles, "With a view to the incorporation of said company under the laws of the Territory of Montana." The purpose was for diverting water from "the stream called Middle Creek," for irrigation and other useful and beneficial purposes and "for the purpose of conducting water from the West Gallatin River to the channel of the stream called Middle Creek in the Gallatin Valley." These Articles of Incorporation chose the name "Upper Middle Creek Supply Ditch," and were signed by E. D. Ferguson, Charles Holmes, Theophile Brunette, Joseph A. Pease, and Frank Cleveland, as trustees.

The Middle Creek Ditch Company filed Articles of Incorporation under the laws of the State of Montana on January 25, 1890, for a period of 20 years, claiming all rights and interests owned by the Upper Middle Creek Supply Ditch Company. These Articles were signed by Charles Holmes, George H. Willson, Samuel L. Fowler, Joseph A. Pease, and John Mitchell, as trustees. In 1909 when the West Gallatin River waters were decreed, the right to divert water from the West Gallatin River to the channel of Middle Creek was denied to this company.

A certificate of re-incorporation was filed on January 25, 1910, extending the existence of the company for 20 years. Trustees at this time were J. E. Martin, S. C. Kenyon, George H. Lyon, F. L. Benepe, and Lee Lenz.

New Articles of Incorporation of the Middle Creek Ditch Company were filed April 12, 1930, for 40 years. The capital stock of the corporation is $10,000, consisting of 100 shares, valued at $100.00 per share.

The company was decreed the following water rights in the Middle Creek Decree, dated March 11, 1897, Case No. 1772: 200 miner's inches of 1864 priority; 400 miner's inches of 1865 priority; 500 miner's inches of 1866 priority; 200 miner's inches of 1867 priority; 100 miner's inches of 1869 priority; 100 miner's inches of 1870 priority; 100 miner's inches of July, 1871 priority; 100 miner's inches of August, 1871 priority; 125 miner's inches of June, 1872 priority; 200 miner's inches of August, 1872 priority; 250 miner's inches of June, 1873 priority; 175 miner's inches of June, 1875 priority; 100 miner's inches of June, 1877 priority; 75 miner's inches of August, 1879 priority; 100 miner's inches of June, 1880 priority; and 175 miner's inches of September, 1881 priority, making a total of 2,900 miner's inches of decreed water under the Middle Creek Ditch. The last three rights (350 miner's inches) listed above are considered flood rights in a normal stream flow year, therefore, this ditch has a water shortage to some extent. Water under this ditch is sold with the land, and one share of company stock is equal to approximately 50 miner's inches of water.

Two users in the Hoy Ditch Company are supplied 150 miner's inches from the company, and 13 individuals in the ditch are supplied supplemental water in the amount of 670 acre feet from the Middle Creek Storage Project. Assessment for operation and maintenance have averaged $10.00 per share during the last ten years.

The Middle Creek Ditch diverts water from Middle Creek or Hyalite Creek on the east bank in Section 3, Township 3 South, Range 5 East, and flows in a northeasterly direction passing the city limits of Bozeman on the west side, and wastes into a slough along the Northern Pacific Railway, about a mile northwest of the city.

In 1952 there were 2,702 acres irrigated from the Middle Creek Ditch with 87 acres potentially irrigable under the system.

(See Map in Part II, Pages 37, 38, and 41).

SPAIN-FERRIS DITCH COMPANY

On December 12, 1905, the water users who were transporting their water through the Spain-Ferris Ditch filed Articles of Incorporation with capitalization of $42,000, divided into 4,200 shares at $10.00 per share. In the formation of the corporation, water rights were exchanged for shares of stock in the ditch company.

The corporation's term of existence was for 20 years from and after the date of filing. In 1909 when the West Gallatin River was adjudicated (Case No. 3850), the company was decreed 4,264 miner's inches of water consisting of 1,200 miner's inches appropriated 1886; 2,764 miner's inches appropriated in 1890; and 300 miner's inches appropriated in 1892. On March 12, 1927, new Articles of Incorporation were filed for a 40 year period, claiming all property owned by the old corporation. In each of the incorporations the company name remained the same. Capital stock of the new organization was $50,000 being divided into 5,000 shares, having a par value of $10.00 per share. At the present time there are 4,200 shares of active stock subscribed to in the ditch company, with each share of stock representing one miner's inch of water. The company, with a total of 4,264 shares of water available, has 64 shares or miner's inches remaining to be disposed of at the company's discretion. In addition to the water decreed to the Spain-Ferris Ditch the ditch is carrying 638 miner's inches of individual decreed water rights of 1894 priority for three users. This water was transferred to the Spain-Ferris Ditch from the Beck-Border Ditch as a matter of convenience to the users. Practically all of the water rights in the ditch are of a comparatively late priority date and should be considered "high water rights." The water supply is generally shut-off sometime between the first and fifteenth of July each year, the exact time depending upon the amount of river flow.

The Spain-Ferris Ditch diverts water from the West Gallatin River through a slough, which starts at a point on the east bank in the northwest quarter of Section 14, Township 2 South, Range 4 East. The main ditch diverts water from the slough approximately three quarters of a mile from its source, then flows northeasterly for a distance of approximately nine miles ending in the vicinity of the airport, Gallatin Field, near Belgrade.

The average water assessments the last 10 years have been 45 cents for operation and maintenance for each share of stock and the same charge applies to the three individual decreed water rights carried by the company.

In 1952, 3,784 acres of land were irrigated from the Spain-Ferris Ditch and 313 acres of potentially irrigable land could be irrigated under present facilities.

(See Map, Part II, Pages 6, 30, and 31).

VALLEY DITCH COMPANY

On May 16, 1906, Alex Smith, Fred and Brown Heiskell, Arie TeSelle, Derk and Annie Hooyenga, Nicholas Froenkena, Walter H. Sales, Martin Leach, George Leach, and Alfred

Leach, associated themselves together for the purpose of forming the Valley Ditch Company. The term of the corporation was designated as 20 years with a capital stock of $7,000 divided into 70 shares having a par value of $100. The Corporation filed on 2,000 miner's inches of water to be diverted from the West Gallatin River, 500 miner's inches from J. B. Corrie Creek or Slough, and 700 miner's inches from the Cameron and Gus Johnson Creek or Slough.

The West Gallatin River Decree, Case No. 3850, dated October 9, 1909, gave the Valley Ditch Company water in the amounts of: 543 miner's inches of 1882 priority; 1,125 miner's inches of 1890 priority; 430 miner's inches of 1891 priority; 247 miner's inches of 1893 priority; 158 miner's inches of 1896 priority; 242 miner's inches of 1899 priority; and 373 miner's inches of 1904 priority.

In addition to the above rights from the West Gallatin River 600 miner's inches of individual rights are carried in the Valley Ditch. These rights were decreed as part of the West Gallatin Decree, Case No. 3850, from Godfrey Creek as follows: Alfred Leach, 200 miner's inches appropriated June 15, 1893; Martin Leach, 200 miner's inches appropriated June 15, 1893; and Walter H. Sales, 200 miner's inches appropriated June 15, 1893.

The above water rights are now owned by five individuals under the Valley Ditch and "The water from these rights may be turned into the Valley Ditch only and at such times when the water supply in the Valley Ditch becomes inadequate for their irrigation needs."

A certificate of extension of corporate existence was filed by the Valley Ditch Company on May 8, 1926, to cover a period of forty years.

The Valley Ditch diverts water from the West Gallatin River at a point on the west bank near the north line of Section 3, Township 2 South, Range 4 East, and flows in a northwesterly direction for approximately ten miles ending in lateral ditches in the vicinity of Churchill.

At the present time there are eleven water users in the ditch company with one share of stock equal to about 43 miner's inches of water. The cost of water has averaged about 75 cents per acre which includes operation and maintenance charges.

In 1952, 2,168 acres were irrigated under the Valley Ditch with 62 acres potentially irrigable under the system.

(See Map in Part II, Pages 29 and 30).

WARM SPRINGS CANAL COMPANY

During the early pioneer days the Warm Springs Canal was used as a mutual ditch and carried some of the older water rights in Gallatin County. Identity of the exact rights has been lost through numerous land transactions.

The Manhattan Company, a development corporation, in buying and selling agricultural land acquired many rights and held all the water rights in the Warm Springs Canal Company at the time of the West Gallatin Decree.

Articles of Incorporation were filed by the company on March 30, 1920 for a period of 40

years. Capital stock in the corporation amounted to $2,100, with 2,100 shares issued at a par value of $1.00 each. The Warm Springs Canal Company owns 1,785 miner's inches of water appropriated June 15, 1889, which was decreed to the Manhattan Company in the West Gallatin Decree, Case No. 3850. One share of stock represents one miner's inch of water with 1,753 shares active and subscribed to by 29 stockholders, leaving 32 shares or inches unsubscribed.

Water charges for operation and maintenance are collected in proportion to the number of shares owned by each stockholder. The water charges vary from year to year depending upon the need for repairs in the canal system.

The canal takes water from Baker Creek at a point on the west bank in the NW¼ of Section 24, Township 1 North, Range 3 East, following a northwesterly course to Warm Springs Creek where water is spilled into the creek. A short distance below this point on Warm Springs Creek the main canal takes out again following a north and northwesterly direction for a distance of about 8 miles where it ends in Section 32, Township 2 North, Range 3 East.

In 1952, there were 1,438 acres irrigated by the Warm Springs Canal and 114 acres of potentially irrigable land under the system.

(See Map in Part II, Pages 4 and 11).

WEST GALLATIN CANAL COMPANY

(Kleinschmidt Canal)

In 1883 about twenty farmers associated themselves together for the purpose of constructing an irrigation canal southwest of the City of Bozeman. After exhausting their own finances they obtained assistance from a Helena merchant named Albert Kleinschmidt and completed their project in 1889. The canal has since been called the "Kleinschmidt Canal" but is the property of the West Gallatin Canal Company. This company consolidated the water rights and filed its first Articles of Incorporation on June 24, 1901. Capital stock totaled $28,000 which was divided into 40 shares at $70.00 per share at par value. The time of corporate existence was expressed as 20 years. Two years after the expiration date of the company new Articles of Incorporation were filed, on August 24, 1923, with the same capitalization and number of shares issued.

The West Gallatin Canal Company was decreed 3,000 miner's inches of water appropriated April 15, 1883, and 3,040 miner's inches of water appropriated June 25, 1901. In addition, the canal carries 200 miner's inches of water decreed to the Gallatin Ranch Company appropriated June 15, 1866; 40 miner's inches decreed to Charles A. Holgate appropriated July 1 1866; and 90 miner's inches of water decreed to Mary L. Doane appropriated June 1, 1872. The Gallatin Ranch Company rights were transferred from the Creamery Ditch and the Mary L. Doane rights were transferred from the Lower Middle Creek Supply Ditch Company. All of the above rights were decreed under the West Gallatin River Decree, Case No. 3850.

Operation and maintenance costs amounted to approximately 50 cents per miner's inch of water for the season of 1952. One share of stock is considered as equivalent to 150 miner's

inches of water in the canal, of this, 75 miner's inches of each share can be classified as a high water right due to the 1901 priority date of half the company's water. The other 75 miner's inches of each share is good throughout the growing season except for extremely dry years. At the present time the Kleinschmidt Canal is carrying 150 acre feet of supplemental water for two of its users from the Middle Creek Storage Project.

The Kleinschmidt Canal diverts water from the West Gallatin River at a point on the east bank in Section 5, Township 4 South, Range 4 East, and flows in a northeasterly direction for approximately twelve miles, irrigating 7,754 acres; and is a source of water for 402 acres of potentially irrigable land.

(See Map in Part II, Pages 36, 37, 40, and 44).

MIDDLE CREEK STORAGE PROJECT (S.W.C.B.)

In order to supplement the water supply for irrigation in Gallatin Valley the State Water Conservation Board received a loan and grant offer from the Federal Government in 1938 to construct the Middle Creek Storage Project. About the same time the Board filed an appropriation dated July 12, 1938, on all the unappropriated water from Middle Creek (also called Hyalite Creek) and its tributaries. The loan and grant offer required the formation of the Middle Creek Water Users' Association as an agency for the distribution of water, to accumulate funds to amortize the cost of the project, and to execute a Water Marketing Contract (see page 49) with the State Water Conservation Board.

The Middle Creek Water Users' Association was incorporated on January 3, 1939, with a capital stock valued at $10,000 divided into 10,000 shares at $1.00 per share. Water Purchase Contracts (see page 49) in the amount of 8,605 acre feet were secured and approved by the Association on June 9, 1939. The original list was comprised of 108 water purchase contracts with the cost of water established at $1.96 per acre foot. In addition to the cost of the water, operation and maintenance charges were set at 26 cents per acre foot.

Bids for construction of the project were received on May 26, 1939, and work was started on the dam July 15, 1939. The dam is located on Middle or Hyalite Creek in Section 15, Township 4 South, Range 6 East, approximately 15 miles south of Bozeman. It is an earth, gravel and rock fill structure, 1,310 feet in length, 110 feet high, and floods an area of 248 acres with a storage capacity of 8,027 acre feet. Above the reservoir is a 27 square mile drainage area, located in a good snow belt, high on the timbered slopes of the Gallatin Range.

Under the same project a diversion canal from Middle Creek to Cottonwood Creek was constructed to transport water to users along Cottonwood Creek. The Cottonwood diversion canal is 3½ miles long and has a carrying capacity of 77 second feet.

This project was scheduled for completion in 1942 but due to shortages of labor, materials, and increased construction costs during and after World War II, it was not ready for operation until the fall of 1950. The first stored water delivered to water users was the season of 1951.

Supplemental water from the reservoir is supplied to users in the Farmers Canal, Hoy Ditch, Middle Creek Ditch, West Gallatin Canal (Kleinschmidt) and to various private ditches.

In 1952 there were 4,520 acre feet of water delivered to 48 users in the above named canals and private ditch systems, with about 3,500 acre feet of water remaining in the reservoir to be sold by the Middle Creek Water Users' Association and the State Water Conservation Board.

WILLOW CREEK STORAGE PROJECT (S.W.C.B.)

On August 20, 1935, the State Water Conservation Board filed an appropriation on all the unappropriated water in Willow Creek. This filing was made a few months prior to the request of the Board for a Government loan and grant to construct the Willow Creek Project. The project consists of a dam and storage reservoir located at the junction of Willow and Norwegian Creeks about 4 miles east of Harrison and 9 miles south of the town of Willow Creek.

The loan and grant offer from the Federal Government, dated December 31, 1935, was received by the State Water Conservation Board and was accepted by the Board on January 7, 1936. This offer called for the construction of the project at an estimated cost of $232,727, of which $104,727 was to be a grant and $128,000 a loan, to be evidenced by the State Water Conservation Board Revenue Bonds, Series "C". The board required the formation of the Willow Creek Water Users' Association and the sale of 12,000 acre feet of water under contract to be approved by the P.W.A.

The Willow Creek Water Users' Association was incorporated on November 18, 1935, the company being capitalized for $20,000 divided into 20,000 shares with a par value of $1.00 per share. The required water purchase contracts (see page 49) were secured and approved by the Association on February 20, 1937, and approved by the State Water Conservation Board on March 22, 1937, immediately following approval by the P.W.A. The Bond transcript was completed and approved by the P.W.A. and the bonds sold to the Government on April 20, 1937.

In order to pay off the cost of the project to the State Water Conservation Board, the Willow Creek Water Users' Association entered into a water marketing contract (see page 49) with the Board in which the Association agreed to pay to the State Water Conservation Board the sum of $9,000 on December 15th each year, beginning with the year 1937 to and including 1965.

The water marketing contract is fulfilled by means of water purchasing contracts entered into by each individual water purchaser, the Willow Creek Water Users' Association and the State Water Conservation Board. The original list consisted of 144 water purchase contracts, totaling 12,000 acre feet of water at 75 cents per acre foot per year, plus operation and maintenance charges of 20 cents per acre foot per year, commencing with the year 1937 to and including the year 1965.

Construction work was started on the project June 16, 1936, and was accepted by the Board as complete on August 18, 1938. The dam is a rock and earth fill structure having a total crest length of 441 feet and is 86 feet in height above the natural creek bed. The reservoir has a storage capacity of 16,775 acre feet to the spillway crest, to be used for supplemental irrigation of land along the Willow Creek Valley. Drainage area above the reservoir is 160 square miles, situated in the high timbered Tobacco Root Mountains and foothills.

Lands above the reservoir are benefited through the exchange of reservoir water for prior normal flow rights belonging to lands below the reservoir. At the present time there are fifty water users in Gallatin County purchasing 3,905 acre feet in addition to 3,143 acre feet used in Madison County.

In 1952 there were 2,912 acres of land irrigated entirely or supplemented by the stored water of the Willow Creek Reservoir, with 590 acres potentially irrigable under existing ditches from this water source.

(See Map in Part II, Pages 1, 2 and 27).

WATER MARKETING CONTRACT

This is an agreement between the Water Users Association and the State Water Conservation Board, whereby the Board agrees to sell to the Association all of the available water of the project, and the Association agrees to distribute same to water purchasers; and provides method of payment of sums due, levying of assessment for operation and maintenance cost, time of notification of such levy to be given water purchasers, time of default and remedies in the event of default.

WATER PURCHASE CONTRACT

This is a contract entered into between the individual water purchasers, the Association and the State Water Conservation Board, whereby, the individual agrees to purchase a definite amount of water, and to pay therefore a definite sum of money on or before a definite day, until a definite future date; in addition to such definite annual sum the individual agrees to pay, such additional sum or sums as may be required annually as his proportionate share of the cost of operation and maintenance of the Association. This contract is void unless the water purchaser executes a Subscription and Pledge Agreement.

BECK-BORDER DITCH (MUTUAL)

On April 13, 1891, John H. Beck and George W. Spring appropriated 300 miner's inches of water from the West Gallatin River and constructed a ditch which later became the present Beck-Border Ditch. In 1894 the ditch was enlarged to accomodate five other water users under the system. Another appropriation was filed on August 28, 1894, for 2,100 miner's inches of water by John H. Beck, George W. Spring, Henry Border, John Matthews, William P. Border, Charles Sprague, and Albert Clifton. Until recent years the ditch was operated under the name Beck-Spring-Border Ditch.

The Beck-Border Ditch is a mutual use water carrier through which eleven water users transport the water pertaining to their individual rights. Decreed water rights of the West Gallatin River (Case No. 3850) carried in the ditch are: A. D. Weaver, 300 miner's inches of 1866 priority; George W. Jenkins, 100 miner's inches of 1872 priority; John Accola, Jr., 62 miner's inches of 1888 priority; Thomas Michener, 97 miner's inches of 1890 priority; E. H. Damerell, 141 miner's inches of 1891 priority; J. N. Brooks, 63 miner's inches of 1894 priority; W. P. Border, 228 miner's inches of 1894 priority; Peter Emmel, 66 miner's inches

of 1894 priority; Louisa Ketterer, 42 miner's inches of 1894 priority; John Accola, Jr., 63 miner's inches of 1894 priority; Charles L. Border, 282 miner's inches of 1894 priority; H. I. Border, 376 miner's inches of 1894 priority; L. N. Cunningham, 91 miner's inches of 1894 priority; E. H. Damerell, 191 miner's inches of 1894 priority; and L. N. Cunningham, 79 miner's inches of 1902 priority. The Thomas Michener rights decreed on Beaver Creek and Mud Creek, tributaries of the West Gallatin River, were transferred from the Michener Ditch. The A. D. Weaver right is conveyed through the Lower Middle Creek Supply Ditch by a carrying right only, and spilled into the Beck-Border Ditch as a matter of convenience to the user. The George W. Jenkins right was transferred from the Lower Middle Creek Supply Ditch.

Point of diversion of the Beck-Border Ditch is on the east bank of the West Gallatin River in the SE¼SW¼ of Section 14, Township 2 South, Range 4 East, and follows a northerly and easterly direction for seven miles where it ends in the SW¼SW¼ of Section 16, Township 1 South, Range 5 East.

Operation and maintenance costs have averaged about 50 cents for each acre of land irrigated.

In 1952, eleven water users irrigated 1,965 acres from the Beck-Border Ditch with 84 acres potentially irrigable under the system.

(See Map, Part II, Pages 30, 31, and 36).

LEWIS DITCH (MUTUAL)

On June 10, 1870, G. S. Lewis diverted water into the Lewis Ditch from the west bank of the West Gallatin River at a point in the NW¼ of the SW¼ of Section 27, Township 1 South, Range 4 East. From this point the ditch traverses a generally northwesterly direction following an old natural drainage channel and finally wasting into Camp Creek.

The West Gallatin Decree, Case No. 3850, shows the following water rights pertaining to the Lewis Ditch: Robert E. Leach, 215 miner's inches appropriated June 15, 1865; Sm. McKennon, 398 miner's inches appropriated June 15, 1865; Walter H. Sales, 264 miner's inches appropriated June 15, 1865; Alexander Smith, 57 miner's inches appropriated June 1, 1866; J. B. Corrie, 63 miner's inches appropriated June 10, 1870; C. A. Sales, 193 miner's inches appropriated June 10, 1870; Eugene Buckley, 274 miner's inches appropriated June 15, 1870; W. S. Erwin, 267 miner's inches appropriated June 15, 1870; Frank Jakle, 458 miner's inches appropriated June 15, 1870; Andrew Morrison, 121 miner's inches appropriated June 15, 1870; Henry TeSelle, 254 miner's inches appropriated June 15, 1870; William Smith, 106 miner's inches appropriated June 20, 1870; W. S. Erwin, 43 miner's inches appropriated June 15, 1897; Alexander Smith, 108 miner's inches appropriated June 15, 1900; and Robert Leach, 51 miner's inches appropriated June 20, 1905.

Since the time of the West Gallatin Decree 88 miner's inches of the Sm. McKennon water right and 90 miner's inches of the Frank Jakle right have transferred ownership and are now carried in the Farmers Canal. It also might be well to mention that C. A. Sales was the successor in interest to the right of G. S. Lewis the original founder of the Lewis Ditch. To date there is a total of 2,604 miner's inches of decreed water carried in the Lewis Ditch.

The basis for water use under the Lewis Ditch is 1 miner's inch for each acre of irrigated land. Operation and maintenance costs are divided in proportion to the amount of water conveyed through the ditch by the 15 present water users.

In 1952 2,064 acres were irrigated and 380 acres potentially irrigable under existing facilities.

(See Map in Part II, Pages 4, 29, and 30).

LOWER MIDDLE CREEK SUPPLY DITCH (MUTUAL)

The lower Middle Creek Supply Ditch diverts water by gravity from the east bank of the West Gallatin River near the center of the west line of NW¼NW¼ in Section 26, Township 2 South, Range 4 East. The ditch traverses a northeasterly course to Middle Creek where water is spilled into the creek and is picked up by several private diversions below. After crossing Middle Creek the ditch continues on another 4½ miles to its terminus in Section 30, Township 1 South, Range 5 East.

The ditch is non-incorporated although stock certificates are issued and the shares of stock are assessable. The association of farmers in the ditch are governed by certain rules and regulations set up in the Articles of Agreement and By-Laws of the non-incorporated ditch company. The number of original shares of stock issued by the ditch company amounted to 17½ shares, with each share equivalent to 190 miner's inches of water. At the present time there are 16½ shares of stock active in the ditch company, which amounts to 3,135 miner's inches. One share or 190 miner's inches of water has been transferred out of the ditch as follows: 9/19 of a share, or 90 miner's inches is carried in the West Gallatin Canal Company (Kleinschmidt Canal), and 10/19 share, or 100 miner's inches, is now carried in the Farmers Canal. In addition to those shares transferred out of the company, 185/190 of a share or 185 miner's inches of water, still listed and assessed by the company is conveyed through the Farmers Canal.

A right of 300 miner's inches decreed to A. D. Weaver in the West Gallatin Decree, Case No. 3850 is also carried in the ditch and listed as a "carrying right only." The owner of this right is not a stockholder in the company and pays only a flat charge for conveyance of the water through the ditch.

The West Gallatin Decree, Case No. 3850, decreed a total of 3,326 miner's inches of water from the West Gallatin River to the Middle Creek Supply Ditch Company and the following tenants in common: L. S. Briggs, J. N. Brooks, Daniel P. Cloninger, Mary L. Doane, Peter Emmel, Henry Harrer, Isabel Hulbert, et al, George W. Jenkins, John M. Kittle, Henry M. Monforton, Robert Riddle, John M. Robinson, Christopher Waterman, and John J. Weaver.

The early priority date of the decreed water assures the ditch company and farmers under the ditch an ample water supply during the entire irrigation season. Charges for operation and maintenance have averaged 60 cents per inch of water annually.

In 1952 there were 2,344 acres irrigated with 345 acres potentially irrigable under the ditch system, or a maximum irrigable acreage of 2,689 acres under the Lower Middle Creek Supply Ditch.

(See Map in Part II, Pages 30, 31, 36, and 37).

MYSTIC LAKE DITCH ASSOCIATION (MUTUAL)

The irrigation ditch known as the Mystic Lake Ditch diverts water from Bozeman Creek (Sourdough), at a point on its west bank, about six miles south of the City of Bozeman, in Section 7, Township 3 South, Range 6 East.

The Association was formed on the 9th day of April, 1938, for the purposes of securing a more economical and efficient operation of the ditch, and also to operate, control, and manage the ditch for the benefit of all owners or their successors in interest.

Articles of Agreement were drawn up to govern the ditch, and included the issuing of shares to conveniently indicate present ownership. The shareholders in the association have the right to convey water from Bozeman Creek through the Mystic Lake Ditch to and upon their respective lands.

A total of 11 shares were issued by the association, 9 of which are active at the present time. When the ditch association was first formed one share represented 100 miner's inches carrying right in the ditch. Since that time the ditch has been enlarged and one share is equal to 200 miner's inches carrying right.

Individual water rights in the Mystic Lake Ditch from the Bozeman Creek Decree, Case No. 1333, as follows:

To Whom Decreed	Date of Priority	No. Miner's Inches
Ben Bisel	1866	100
John Hanson	1866	100
Robert Menefee	1866	100
Marion Flaharty	1872	100
W. W. Wolverton	1872	125
William Hoff	1883	50
Bruce Levervich	1883	50

and a water right of 50 miner's inches decreed to Middle Creek Ditch Company, Case No. 1772.

In addition to the above rights carried in the Mystic Lake Ditch there are 525 miner's inches of Bozeman Reservoir Company water conveyed through the ditch.

The association is a non-profit organization with the shares issued having no par value. Regular assessments have averaged $57.00 per share each year, plus operation and maintenance charges of $10.00 per share annually.

The main ditch is in good condition, having been recently cleaned and repaired so as to insure conveyance of the full 1,200 miner's inches of water.

(See Map, Part II, Pages 37, 38, 41, and 42).

PERKS CANAL (MUTUAL)

Through various real estate transactions the Manhattan Company, a land, livestock, and development corporation, became the owner of the early water rights pertaining to the Perks

Canal. All of these water rights were decreed to the Manhattan Company in 1909 when the West Gallatin Decree was handed down in Case No. 3850. In later land transactions, the present water users of the canal became the owners of 982 miner's inches of water of June 15, 1868, priority. The water users under the Perks Canal are now operating by a mutual agreement. They have divided the water into twelve hundred shares, with each share equivalent to .82 of a miner's inch of water. All the shares have been subscribed to and are held by 23 users. Each user contributes forty cents per share held to cover operation and maintenance cost plus hiring of a water commissioner.

The Perks Canal diverts water on the west bank, near the confluence of Spring Creek and Camp Creek, in the South East quarter of Section 23, Township 1 North, Range 3 East. It flows in a northerly direction terminating in laterals in Section 35 Township 2 North, Range 3 East. The water users under the canal system have never experienced a water shortage during any period of its existence.

In 1952, 973 acres of land were irrigated under the Perks Canal with no potentially irrigable land lying under the system.

(See Map, Part II, Pages 4, 11).

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
MISSOURI RIVER BASIN							
***Missouri River—Main Stem**	3	3,200	80				
Jefferson River	8	21,000	525				
Antelope Creek	2	450	11.25				
Sappington Spring	1	650	16.25				
Girard Creek	1	40	1				
Galen Springs	2	85	2.125				
Unnamed Slough	0	50	1.25				
Hankinson Spring	1	10	.25				
Seepage and waste	8	820	20.5				
Willow Creek	12	8,325 and all surplus	208.125	5591	34	100	2.5
				6600	1	3,082	77.05
Two Mile Spring	1	200	5				
Unnamed Spring	1	40	1				
Dry Hollow Spring	2	700	17.5				
Wells (6 wells in use—no filings)							
Madison River	27	941,880	23,547				
Grayling Creek	13	3,483	87.075				
Counter Springs	1	40	1				
Slough Creek	1						
Horse Thief Springs	1	All					
Maple Creek	1	360	9				
North Fork Madison River	1	160	4				
Red Creek	5	1,370	34.25				
Grouse Spring	3	55	1.375				
Fairview Spring	1	5	.125				
South Fork Madison River	1	6.8	.17				
East Fork Cream Creek or Pulsifer Creek	1	320	8				
Muskrat Pond	1	80	2				
Dwelle Creek	2	260	6.5				
Denny Creek	15	3,710	92.75	10170	3	490	12.25
Cold Spring	1	40	1				
Unnamed Springs	2	30	.75				
Lonesome Spring	1	100	2.5				
Elk Creek	1	40	1				
Trapper Creek	1	200	5				
Zimmerman Spring	4	720	18				
Unnamed Springs	5	480	12				
Lonesomehurst Spring	1	All					
Copper Creek	1	160	4				
Watkins Creek	4	1,040	26				
Clark Springs Creek	1	10	.25				
Kirkwood Creek	1	500	12.5				
Unnamed Spring	2	12	.3				
Spring Creek	1	160	4				
Elk Creek	10	2,100	52.5				
Spring Gulch	1	100	2.5				
North Spring Gulch	1	120	3				
Unnamed Spring	2	600	15				
Morse Creek	1	2,000	50				

* Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Slough	6	3,900	97.5				
Unnamed Spring Creek	2	20,000	500				
Unnamed Springs	5	1,050	26.25				
Madison Dike Ditch	2	500	12.5				
Cadman Slough Creek	1	1,000	25				
Unnamed Creek	1	100	2.5				
Waste Water	1	30	.75				
Gallatin River	6	1,930	48.25				
West Gallatin River	98	1,220,789	30,519.725	3850	233	96,889.4	2,422.235
				4461	1	80	2
				4706	1	1,606.4	40.16
				4786	1	700	17.5
				6751	1	2,500	62.5
				8030	9	755	18.875
Monument Creek	0	All					
White Spring (Snowflake Sprgs.)	1	320	8				
Sage Creek	0	All					
Taylor Forks (Dodge Creek)	5	1,760	44	3850	1	100	2.5
Buffalo Horn Creek	0	All					
Cinnamon Creek	2	460	11.5				
Buck Creek	0	All					
Twin Cabin Creek	0	All					
Unnamed Spring	1	50	1.25				
Beaver Creek	1	500	12.5	3850	1	50	1.25
Unnamed Spring	1	20	.5				
Porcupine Creek	1	300	7.5	3850	2	187	4.675
Unnamed Spring	1	25	.625				
Mud Creek	1	2,000	50	3850	1	47	1.175
West Fork	4	23,500	587.5				
North Fork of West Fork	1	2,000	50	3850	1	50	1.25
Black Butte Creek	3	2,500	62.5				
Dudley Creek	2	15,000	375	3850	1	55	1.375
Levinski Creek	1	2,500	62.5	3850	1	30	.75
Unnamed Creek	1	5	.125				
Tamphery Creek	1	35	.875				
Unnamed Spring	1	80	2				
Mike Creek	1	100	2.5	3850	1	40	1
Karsts Cold Spring	1	3	.075				
Moose Creek	1	144	3.6				
Hell Roaring Creek	3	4,000	100	3850	2	90	2.25
Logger Creek	2	100	2.5	3850	1	20	.5
Lime Creek	1	50	1.25				
Spanish Creek	8	1,560	39	3850	16	1,090	27.25
				6137	2	160	4
North Fork Spanish Creek	0	0	0				
Green Hollow Creek	1	200	5	3850	2	80	2
South Fork Spanish Creek	1	640	16				
Twin Creeks	1	200	5	3850	1	61	1.525
Granite Creek	1	All					
Edwards Creek	1	160	4	3850	1	80	2
Yankee Creek	1	100	2.5	3850	1	40	1
Stone Quarry Creek	1	100	2.5	3850	1	40	1
Brown's Gulch	3	948	23.7				

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Wilson Creek	4	600	15	3850	9	753	18.825
Bear Creek	13	8,530	213.25	3850	16	3,025	75.625
Waste Water	2	250	6.25	3850	1	50	1.25
Unnamed Springs	1	All		3850	4	157	3.925
Wortman Creek	1	140	3.5	3850	1	42	1.05
South Cottonwood Creek	17	11,390	284.75	3850	35	3,321	83.025
Henry Springs	1	All					
Unnamed Springs	1	All					
Unnamed Slough	6	494	12.35				
Unnamed Springs	4	475	11.875				
Reed Canyon Creek	2	All					
Unnamed Spring	1	10	.25				
Fish Creek	1	All		3850	6	227	5.675
Spring Creek	0	0	0	3850	3	124	3.1
Maryott Creek	1	50	1.25				
Unnamed Spring	1	50	1.25				
Unnamed Spring Creek	1	80	2				
Bog Spring Creek	1	120	3				
Crystal Spring Creek	1	120	3				
Rock Spring Creek	1	120	3				
Waste Water	5	440	11				
Elston Creek (Springs)	1	All		3850	1	All	
Sloughs and Swamps	3	600	15				
Drainage	1	125	3.125				
Springs and Waste	2	280	7				
Yellow Spring	2	40	1				
Unnamed Springs	3	430	10.75				
Unnamed Slough	1	1,200	30				
Waste Water	7	1,100	27.5				
Godfrey Canyon Creek	2	375	9.375	3850	3	600	15
Unnamed Spring	1	All					
Sloughs	1	600	15				
Dragline Ditch	1	200	5				
Waste Water	2	525	13.125				
Unnamed Spring	3	300	7.5				
Drain Ditches	2	200	5				
Unnamed Spring Creek	1	300	7.5				
Unnamed Spring	2	All					
Knox Creek	1	All					
Ridgely Creek	0	0	0	4213	2	252	6.3
Baker (Big) Creek	6	7,600	190	3850	10	2,618.6	65.465
Unnamed Spring	1	50	1.25				
Spring or Trout Creek	3	860	21.5	3850	1	40	1
Warm Springs	6	16,150	403.75				
Warm Springs Creek	0	0	0				
Camp Creek	11	21,059	526.475	3850	4	1,102	27.55
Unnamed Springs	2	250	6.25				
Unnamed Springs Cr.	1	16	.4				
Leach Creek	2	400	10				
Unnamed Spring Creek	1	100	2.5				
Randall Creek	2	300	7.5				
Slough	1	100	2.5	3850	1	20	.5
Little Creek	2	1,000	25				

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
East Gallatin River	33	27,267.5	681.687	1594 2889 3700 6440	9 5 3 3	2,509.5	62.737
Rocky (Canyon) Creek	6	3,590	89.75	4456	2	3,007.5	75.188
Tunnel Creek	1	100	2.5				
Middle or Jackson Creek	9	1,346.67	33.667				
Unnamed Springs	3	205	5.125				
Marble Creek	1	50	1.25				
Meadow Creek	3	260	6.5				
Thompson Creek	2	253	6.325				
Hodson Creek	1	200	5				
Unnamed Spring	2	50	1.25				
Parker Creek	1	10	.25				
Pitcher or Solin Creek	2	150	3.75				
Unnamed Spring	1	50	1.25				
Bear (Baker) Creek	16	4,190	104.75	3206 3748	9 1	690	17.25
Unnamed Spring Cr.	2	160	4				
Sunny Brook Branch	1	50	1.25				
Spring or Canon Creek	5	310	7.75				
Unnamed Spring	7	415	10.375				
Kelly Creek	1	320	8				
Little Bridger Creek	2	60	1.5				
Spring Creek	10	960	24				
Unnamed Spring Creek	1	400	10				
Coleman Creek	1	All					
Unnamed Spring	1	All					
Waste Water	6	875	21.875				
Bozeman Creek	28	14,860	371.5	1333 2493 3030	18 3 2	3,530	88.25
Mystic Lake and 6 small lakes	8	9,000	225				
Limestone or Lime Kiln Creek	4	300	7.5				
Nash Spring Creek	2	150	3.75				
Leverich Creek	0	0	0				
Nichols Creek	1	40	1				
Unnamed Spring Creek	1	50	1.25				
Bird Springs Creek	1	All					
Hoffman Spring Creek	1	50	1.25				
Alderson Spring	2	45	1.125				
Unnamed Springs	21	3,280	82				
Slough and Swamp	8	1,515	37.875				
West College Spring	2	200	5				
Slough	3	275	6.875				
Waste Water	31	3,130	78.25				
Bridger Creek	10	2,930	73.25	1594	3	260	6.5
Maynard Creek	0	0	0				
Unnamed Spring	2	80	2				
Jones Spring Creek	1	800	20				
White Creek	1	200	5	3066	1	50	1.25
Pine or Perkins Creek	2	1,000	25				
Stone Creek	1	200	5				

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record)			Decreed Rights			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
School Gulch or Luce Creek	1	500	12.5				
Spring or Proffit Creek	5	850	21.25				
Unnamed Spring	1	20	.5				
Unnamed Spring Creek	1	5,184	129.6				
Grouse Canyon Creek	1	200	5				
Day Creek	1	30	.75				
Beasley Creek	1	200	5				
Drain Ditch	0	0	0				
Unnamed Spring	1	All					
Whittman Creek	0	0	0				
Place Creek	3	200	5				
Unnamed Creek	0	0	0				
Stubblefield Creek	2	110	2.75				
Unnamed Spring Creek	1	All					
Woods Creek	1	All					
Lyman Creek	21	3,670	91.75	1594 4562	2 1	277.15	6.929
Waste Water	3	260	6.5				
Waste Water	7	3,050	76.25				
Unnamed Spring Creek	4	545	13.625				
Ruffner Creek	1	25	.625				
Spring Creek	1	100	2.5				
Churn Creek	2	All					
Unnamed Spring	1	All					
June Stiff Creek	1	35	.875				
Deer Creek	2	90	2.25				
Unnamed Spring	1	All					
Sipes Canyon	1	All					
Unnamed Spring	1	20	.5				
Unnamed Spring Creek	0	0	0				
North Cottonwood Creek	2	400	10	6757	6	330	8.25
Walton Creek	1	50	1.25				
Watts Creek	1	40	1				
Schafer Canyon Creek	2	340	8.5	4064	2	65.5	1.637
Green Canyon Spring	1	100	2.5				
Bostwick Creek	5	300	7.5	5317	9	460	11.5
Unnamed Spring Creek	2	250	6.25				
Dawes Spring	1	500	12.5				
Mathews Spring	1	500	12.5				
Middle or Hyalite Creek	45	22,538	563.45	1772	39	5,440	136
Unnamed Springs	3	30	.75				
Johnson Creek	1	100	2.5				
Unnamed Spring	1	50	1.25				
Unnamed Spring Creek	1	200	5				
Elk Grove Slough	1	100	2.5	5292	3	350	8.75
Unnamed Springs	2	150	3.75				
Dry Creek	5	510	12.75				
John Fuller Ranch Spring	2	60	1.5				
Maguire Creek	2	120	3				
Parsons Grove Creek	1	75	1.875				
Waste Water	2	250	6.25				
Unnamed Creek	1	75	1.875				
Unnamed Spring	2	120	3				

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Benhart or Spring Creek	1	500	12.5				
Smith Creek	5	1,375	34.375				
Trout Creek	1	200	5				
Ross Creek	18	18,519	462.975	6440	44	3,934	98.35
Unnamed Spring	1	All					
Springhill Creek	1	900	22.5				
Unnamed Spring Creek	1	50	1.25				
Jones Creek	1	All		6440	1	25	.625
Truman Creek	0	0	0	6440	2	150	3.75
Dry Fork Creek	3	145	3.625	6440	4	150	3.75
Unnamed Spring	1	100	2.5				
Waste Water	1	100	2.5				
Reese Creek	5	950	23.75	6429	4	500	12.5
Unnamed Springs	2	135	3.375				
Tom Reese Creek	0	0	0	6429	1	150	3.75
Corbley Creek	2	400	10	6429	2	400	10
Limestone Creek	0	0	0	1596	1	125	3.125
Bill Smith Creek	1	75	1.875				
Unnamed Spring	1	30	.75				
North Cottonwood Creek	9	1,895	47.375	3783	6	785	19.625
Swamp	1	40	1				
Hayes Creek	2	150	3.75				
Bear Creek	2	100	2.5	4400	11	245	6.125
Unnamed Spring	2	175	4.375				
Gum Creek	1	40	1				
Slough	0	0	0	4348	1	50	1.25
Foster Creek	1	60	1.5	7395	2	25	.625
Unnamed Spring	1	5	.125				
Dry Creek	5	1,230	30.75	605	3		
				751	2	340	8.5
				1627	2		
Unnamed Spring	2	35	.875				
Swamp	1	60	1.5				
Poison Hollow Creek	2	100	2.5				
Coyote Creek	1	50	1.25				
LaRue or Stant Creek	1	120	3	5614	5	145	3.625
Unnamed Spring	1	100	2.5				
Blackfoot Creek	1	40	1				
Unnamed Spring	1	100	2.5				
Emigrant Creek	3	1,210	30.25				
Lonetree Creek	1	50	1.25				
Waste Water	1	25	.625				
Pass Creek	7	2,240	56	751	3	150	3.75
Johnson Canyon Creek	1	50	1.25	751	1	50	1.25
Gallop Creek	0	0	0				
Nelson's Swamp	1	50	1.25				
Little Bottom Creek	1	All					
Beaver Creek	1	70	1.75				
Johnson Spring	1	150	3.75				
Unnamed Spring	1	All					
Mill Canyon Creek	5	850	21.25	751	2	100	2.5
Unnamed Springs	3	60	1.5				
Quaggle Creek	0	0	0				

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Reynolds Creek	1	50	1.25	4002	5	86	2.15
Unnamed Spring	1	100	2.5				
Story Creek	4	450	11.25				
Monforton Creek	2	200	5				
Cowan Creek	1	All					
Unnamed Spring	2	480	12				
Doc Canyon Creek	1	All					
Spaulding Brook	0	0	0	4269	2	60	1.5
Gibson Creek	0	0	0				
Bull Run Creek	4	1,270	31.75	4212	6	347	8.675
Unnamed Spring	2	250	6.25				
Swamp	2	175	4.375				
Waste Water	4	1,080	27				
Unnamed Spring Creek	1						
Logan Spring	1	100	2.5				
Water Cress Spring	1	100	2.5				
Unnamed Springs	5	675	16.875				
Waste Water	6	1,700	42.5				
Unnamed Spring Creek	1	50	1.25				
Beef Shed Springs	1	200	5				
Cottonwood Creek	1	50	1.25				
Unnamed Spring	1	75	1.875				
Stevens Spring	1	300	7.5				
Dunbar Spring	1	500	12.5				
Slough	1	200	5				
Rea (Moss) Creek	8	1,990	49.75				
Unnamed Spring	1	500	12.5				
Hot Springs Creek	0	0	0				
Bonnie Brook Creek	1	200	5				
Waste Water	3	530	13.25				
Unnamed Spring Creek	2	All or 50	1.25				
Unnamed Spring	1	400	10				
Home Gulch Creek	2	150	3.75				
Unnamed Springs	2	130	3.25				
Slough	1	200	5				
Pole Gulch Creek	1	400	10				
Earthquake Springs	1	100	2.5				
Sawmill or Davis Creek	1	100	2.5				
Garden Gulch	1	25	.625				
Sixteen Mile Creek	17	3,720	93				
Lost Creek	1	300	7.5				
Elk Creek	1	40	1				
Sheep Creek	1	40	1				
East Meadow Creek	0	0	0				
Basin Creek	5	800	20				
Spring Creek	1	60	1.5				
Middle Fork Meadow Creek	0	0	0				
Sheep Camp Creek	1	100	2.5				
Winter Creek	1	50	1.25				
Indian Creek	1	100	2.5				
Baker Creek	1	25	.625				
Rock Spring	1	1	.025				

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Tent Spring	1	1	.025				
Paddy's Run	1	All					
Middle Fork Sixteen Mile Creek	6	1,180	29.5				
Cottonwood Spring	1	100	2.5				
Unnamed Spring Creek	1	100	2.5				
Bear Skull Creek	1	200	5				
Unnamed Spring Creek	1	50	1.25				
Unnamed Springs	4	260	6.5				
South Fork Sixteen Mile Creek	7	1,120	28				
Brady Creek	1	300	7.5				
Unnamed Creek	4	120	3				
Adolph Creek	1	50	1.25				
Unnamed Spring Creek	1	50	1.25				
Haw Gulch	1	30	.75				
Brenner Creek	2	120	3	6428	2	120	3
Garden Creek	1	25	.625				
Big Water Springs	2	160	4				
Unnamed Springs	3	45	1.125				
Eagle Nest Springs	1	40	1				
Deer Park Creek	1	25	.625				
Unnamed Creek	2	240	6				
Spring Creek	1	100	2.5				
Unnamed Spring	1	2	.05				
Roy Gulch	2	65	1.625				
Unnamed Springs	3	16	.4				
Big Spring	1	10	.25				
Totals	1,130	2,557,682.97	63,942.074		650	145,661.05	3,641.526
Yellowstone River—Main Stem							
Tom Miner Creek	0	0	0				
Sunlight Creek	0	0	0				
Trail Creek	2	120	3				
Shields River	0	0	0				
Little Cottonwood Creek	0	0	0				
Unnamed Spring	1	500	12.5				
Wallrock or Basin Creek	2	300	7.5	2717	2	225	5.625
Spring Creek	2	260	6.5				
Flathead Creek	1	200	5	2717	5	735	18.375
Unnamed Springs	4	350	8.75				
North Fork Flathead Creek	9	2,145	53.675	2717	7	600	15
Dixon Creek	1	150	3.75				
Frazier Creek	7	1,450	36.25	2717	7	1,050	26.25
McDonald Creek	1	200	5	2717	1	40	1
South Fork Flathead Creek	19	5,916	147.9	2717	11	1,170	29.25
Unnamed Spring Creek	1	100	2.5				
Dry Lake	1	5,000	125				
Fairy Lake	2	5,500	137.5				
Fairy Creek	4	1,540	38.5	2717	8	895	22.375
Unnamed Springs	3	845	21.125				
Geisey Creek	1	200	5				
Miller Creek	1	All					
Middle Fork or Corral Creek	3	1,344	33.6	2717	7	685	17.125

WATER RIGHT DATA — GALLATIN COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Spring Creek	1	50	1.25	2717	1	50	1.25
Green Canyon Creek	5	770	19.25	2717	6	340	8.5
Little Muddy Creek	5	555	13.875	2717	3	280	7
Mud Creek	1	200	5				
Jackies Creek	1	200	5				
Willow Spring	1	100	2.5				
Big Muddy Creek	4	1,050	26.25	2717	1	197.6	4.94
Unnamed Springs	3	230	5.75				
Meeker Creek	1	100	2.5	5037	1	100	2.5
Unnamed Spring Creek	1	160	4				
Brackett Creek	0	0	0	2717	2	130	3.25
Unnamed Spring Creek	1	50	1.25				
Horse Creek	0	0	0	2717	2	60	1.5
Kellogg Creek	1	50	1.25				
Weasel Creek	1	150	3.75				
Skunk Creek	1	60	1.5	2717	1	30	.75
Nixon Creek	2	100	2.5				
Totals	94	29,945	748.625		65	6,582.6	164.69
Drainages in Gallatin County not located							
Lost Brook	1	300	7.5				
Race Creek	1						
Big Spring Creek	1	All					
Slough	1	3,000	75				
Totals	4	3,300	82.5				

WATER RESOURCES SURVEY

GALLATIN COUNTY
MONTANA

Part II

Maps Showing Irrigated Areas

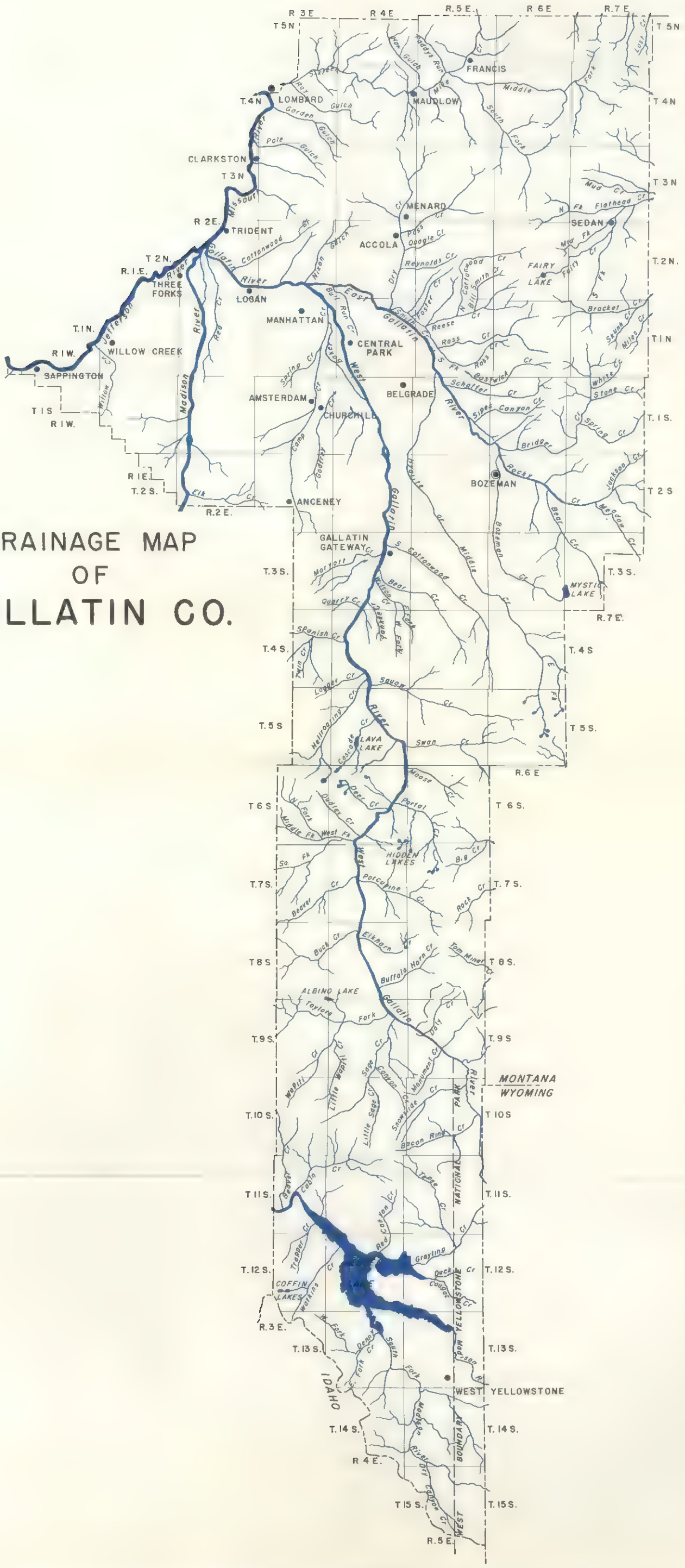
Published by

STATE ENGINEER'S OFFICE
Helena, Montana
January, 1953

(Reprint as of June, 1961)

MAP INDEX

DRAINAGE MAP OF GALLATIN CO.



MAP SYMBOL INDEX

BOUNDARIES

- COUNTY LINE
- NATIONAL FOREST LINE

DITCHES

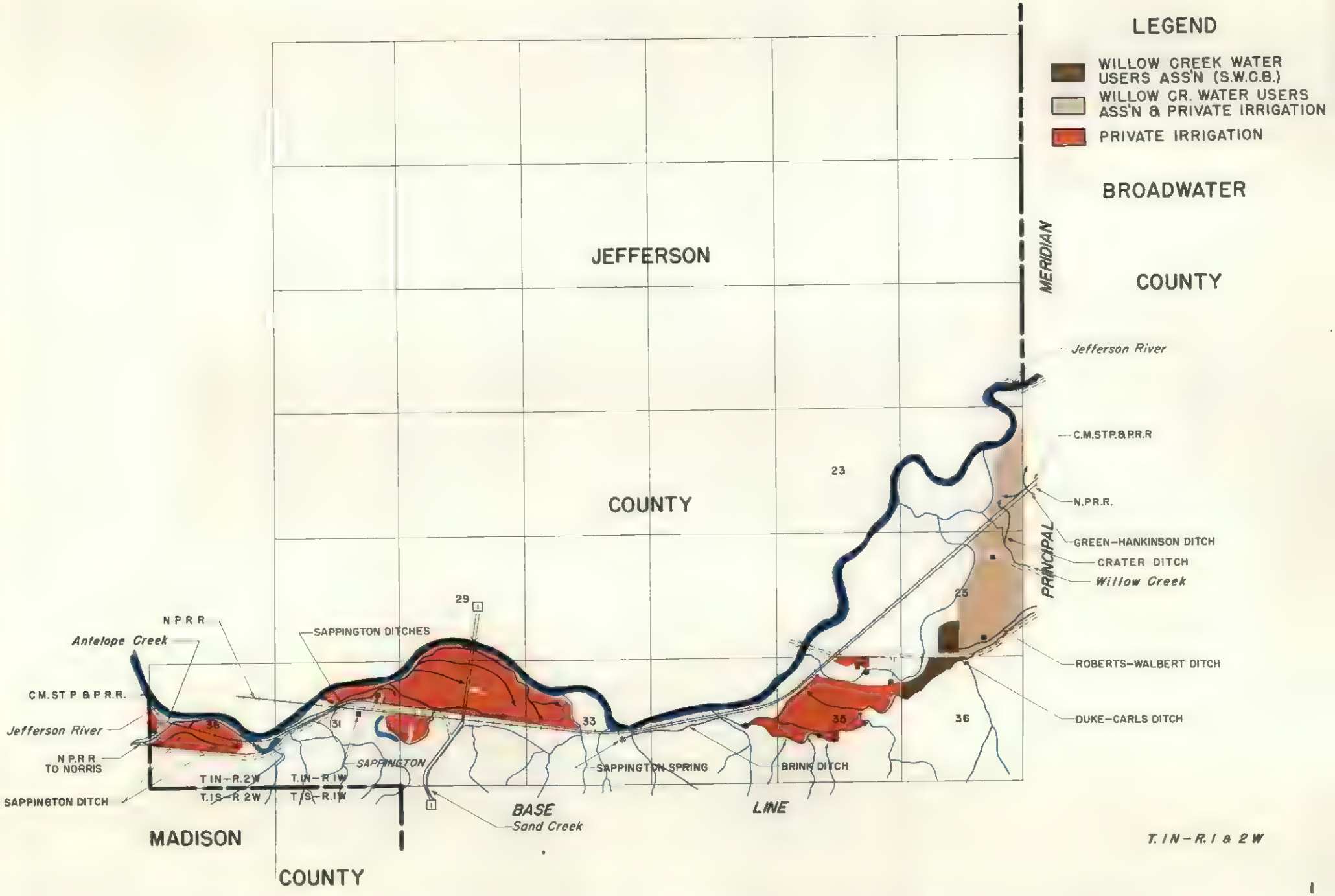
- CANALS OR DITCHES
- DRAIN DITCHES
- PROPOSED DITCHES

TRANSPORTATION

- PAVED ROADS
- UNPAVED ROADS
- RAILROADS
- STATE HIGHWAY
- U.S. HIGHWAY
- AIRPORT

STRUCTURES & UNITS

- DAM
- DIKE
- FLUME
- SIPHON
- SPILL
- SPRINKLER SYSTEM
- WEIR
- PIPE LINE
- PUMP
- PUMP SITE
- RESERVOIR
- WELL
- NATURAL CARRIER USED AS DITCH
- SPRING
- SWAMP
- GAUGING STATION
- POWER PLANT
- STORAGE TANK
- CEMETERY
- FAIRGROUND
- FARM OR RANCH UNIT
- LOOKOUT STATION
- RANGER STATION
- RAILROAD TUNNEL
- SCHOOL
- SHAFT, MINE, OR DRIFT


LEGEND
WILLOW CREEK WATER USERS ASS'N (S.W.C.B.)
WILLOW CR. WATER USERS ASS'N & PRIVATE IRRIGATION
PRIVATE IRRIGATION
BROADWATER
COUNTY
JEFFERSON
COUNTY
MADISON
COUNTY
PRINCIPAL MERIDIAN
BASE LINE
Jefferson River
C.M.ST.P.&P.R.R
N.P.R.R.
GREEN-HANKINSON DITCH
CRATER DITCH
Willow Creek
ROBERTS-WALBERT DITCH
DUKE-CARLS DITCH
BRINK DITCH
SAPPINGTON SPRING
SAPPINGTON
SAPPINGTON DITCHES
N.P.R.R
Antelope Creek
C.M.ST.P.&P.R.R.
Jefferson River
N.P.R.R TO NORRIS
SAPPINGTON DITCH
Sand Creek
T.1N-R.2W
T.1S-R.2W
T.1N-R.1W
T.1S-R.1W
T.1N-R.1 & 2W
23
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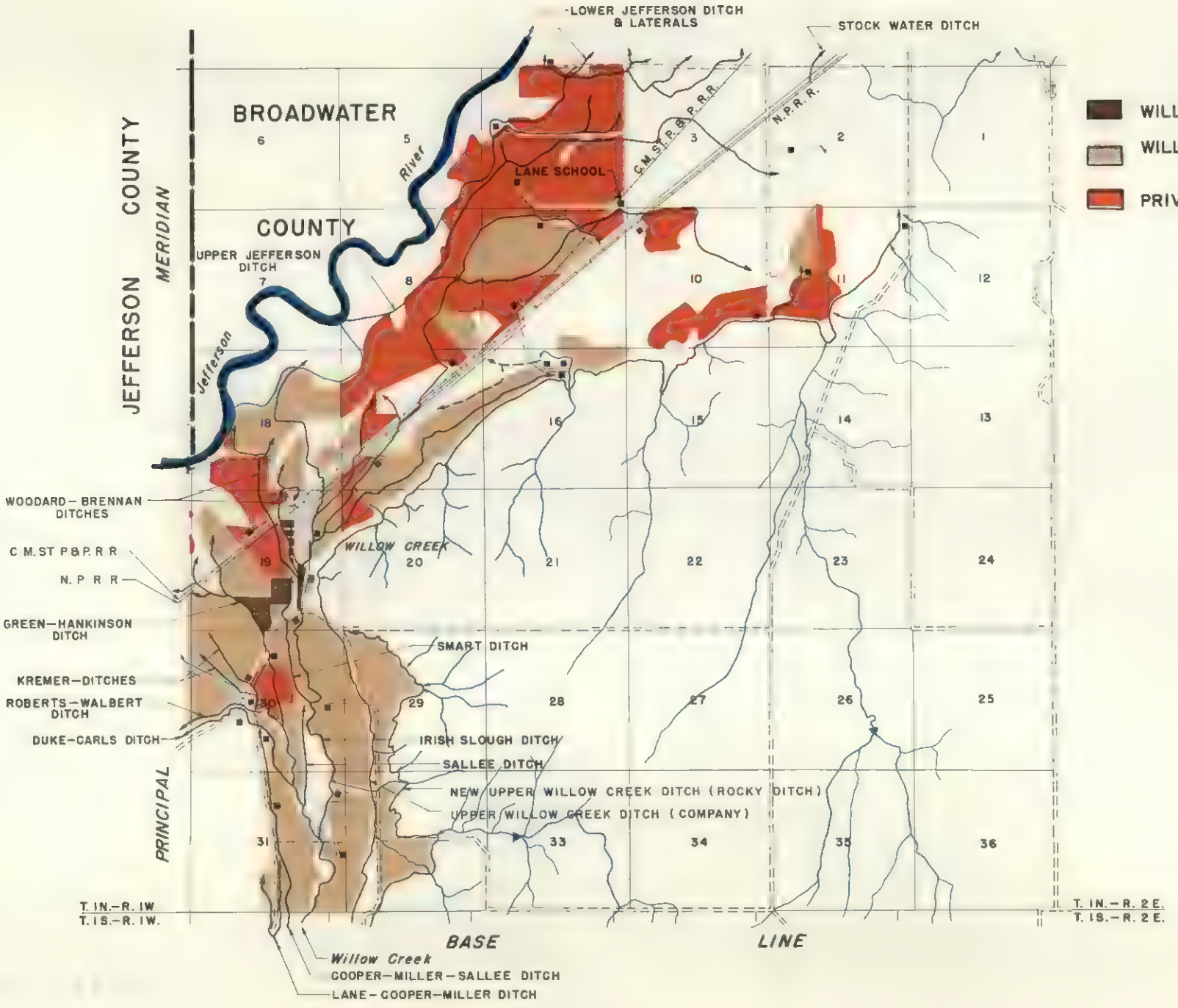
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STOCK WATER DITCH
LEGEND
WILLOW CR. WATER USERS ASS'N
WILLOW CR. WATER USERS ASS'N & PRIVATE IRRIGATION
PRIVATE IRRIGATION
BROADWATER COUNTY
JEFFERSON COUNTY
MERIDIAN
PRINCIPAL
BASE LINE
Jefferson River
LANE SCHOOL
C.M.ST.P.&P.R.R.
N.P.R.R.
UPPER JEFFERSON DITCH
WOODARD–BRENNAN DITCHES
C M.ST P&P. R R
N. P R R
GREEN–HANKINSON DITCH
KREMER–DITCHES
ROBERTS–WALBERT DITCH
DUKE–CARLS DITCH
WILLOW CREEK
SMART DITCH
IRISH SLOUGH DITCH
SALLEE DITCH
NEW UPPER WILLOW CREEK DITCH (ROCKY DITCH)
UPPER WILLOW CREEK DITCH (COMPANY)
Willow Creek
COOPER–MILLER–SALLEE DITCH
LANE–COOPER–MILLER DITCH
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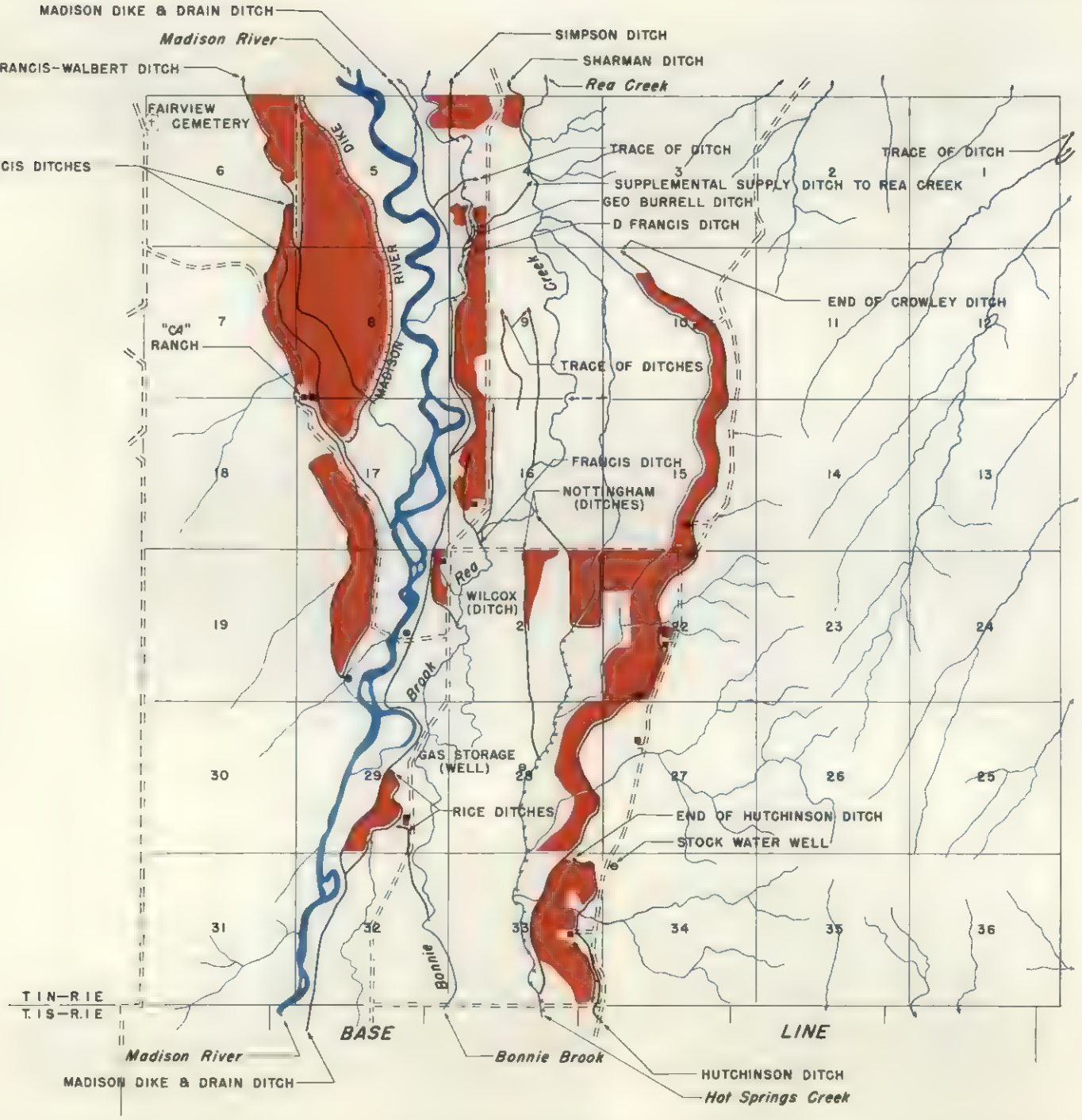
T. IS.–R. IW.
T. IN.–R. 2 E.
T. IS.–R. 2 E.
T. IN–R. IE



LEGEND

PRIVATE IRRIGATION

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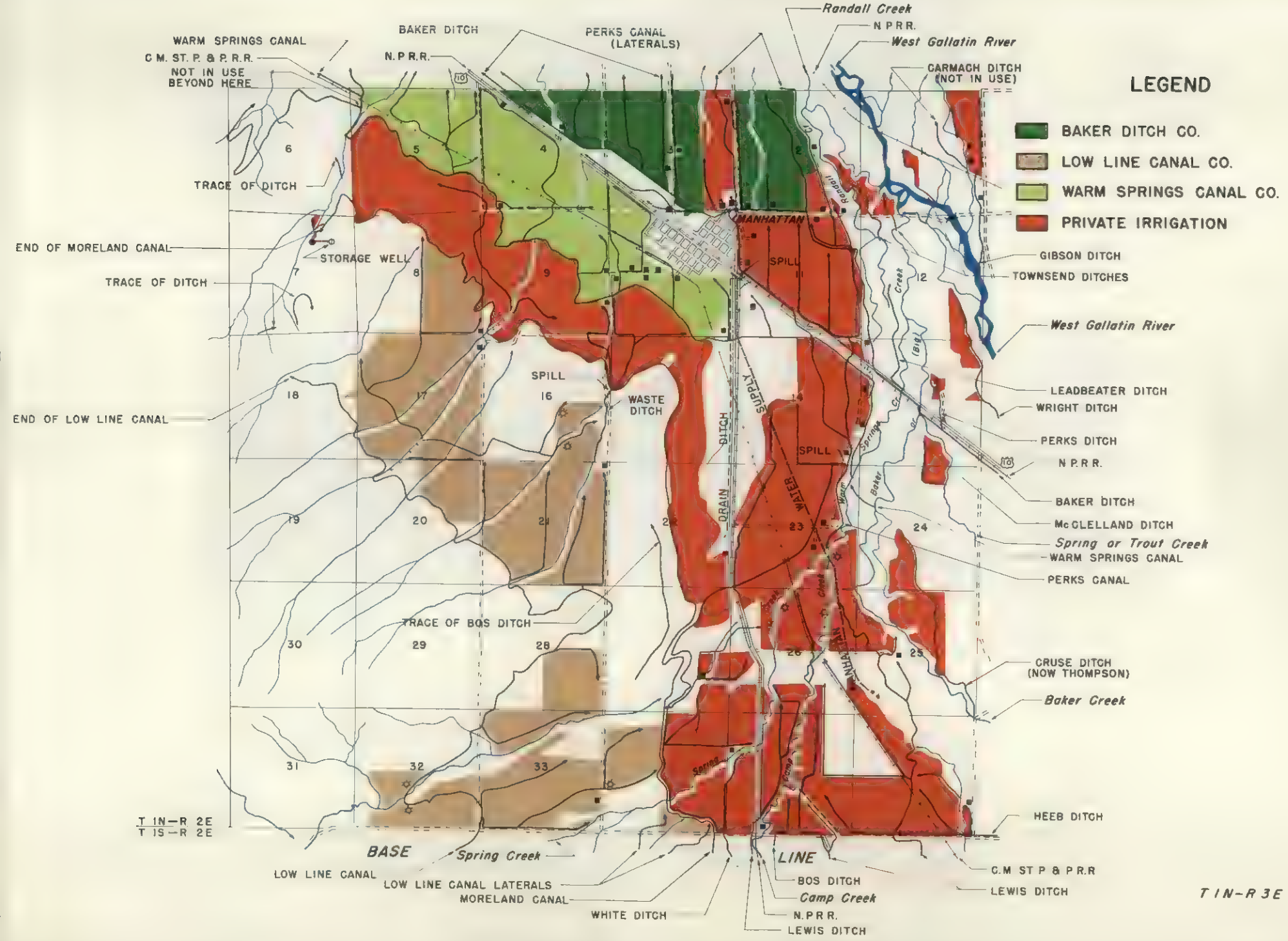
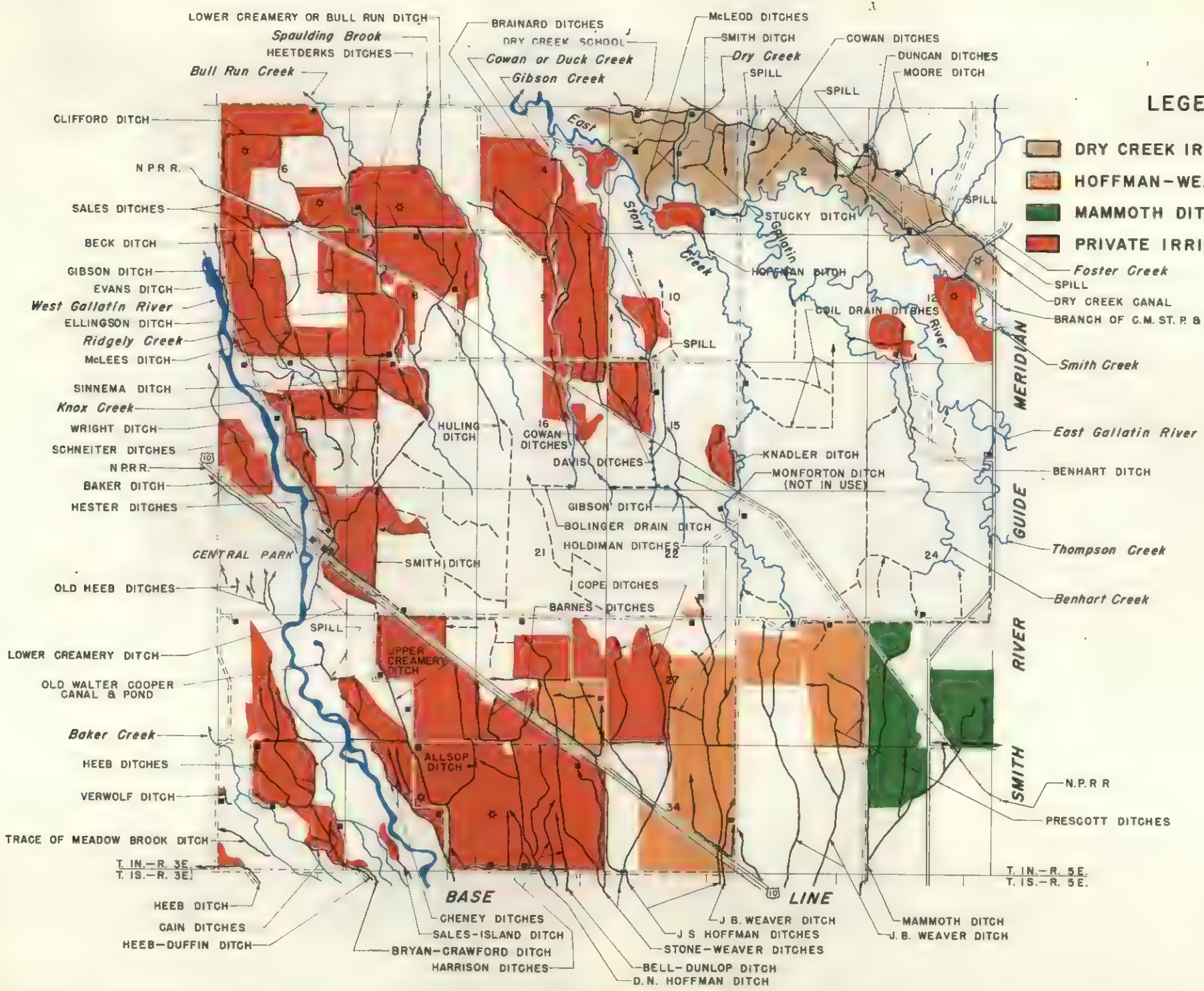
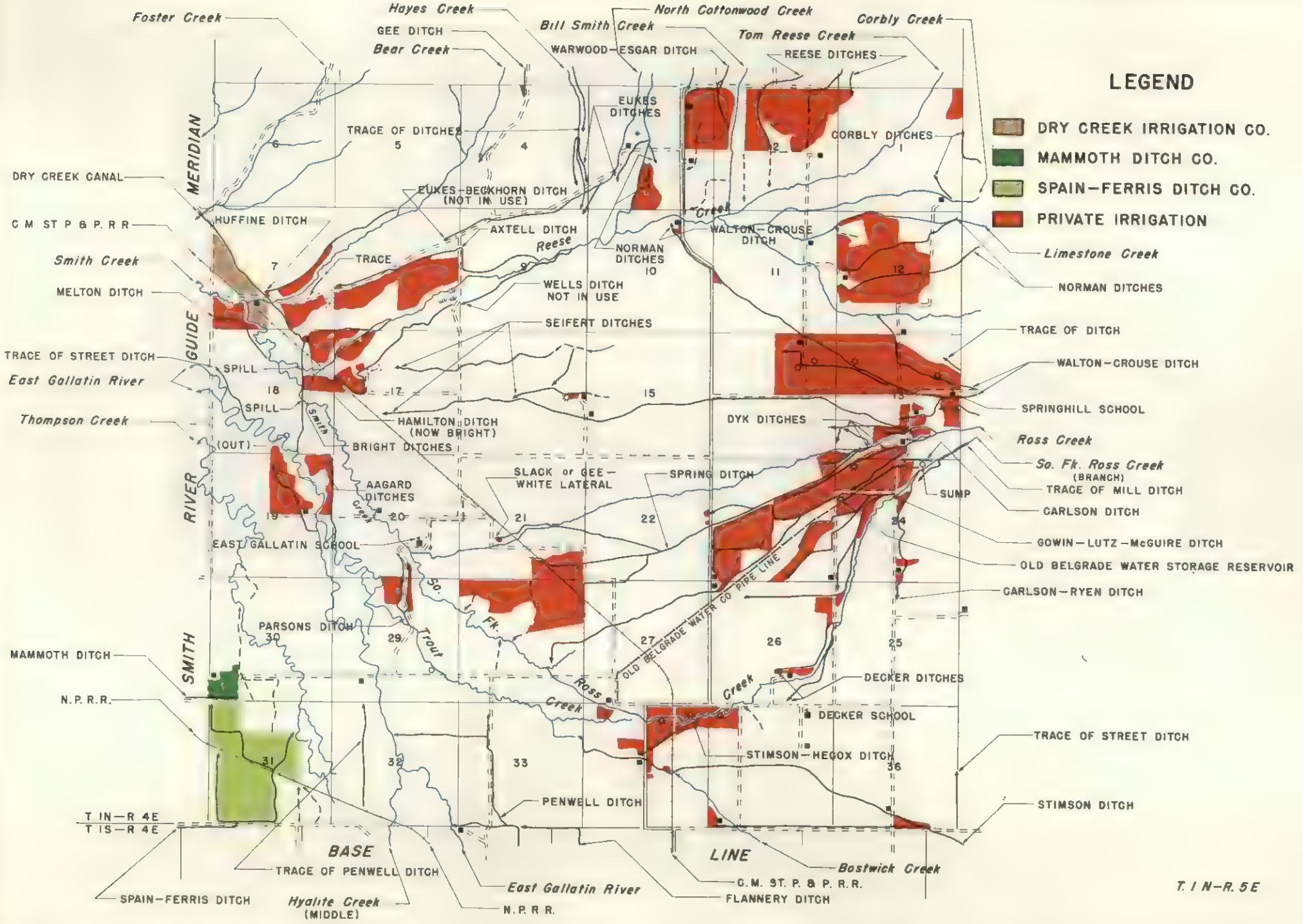
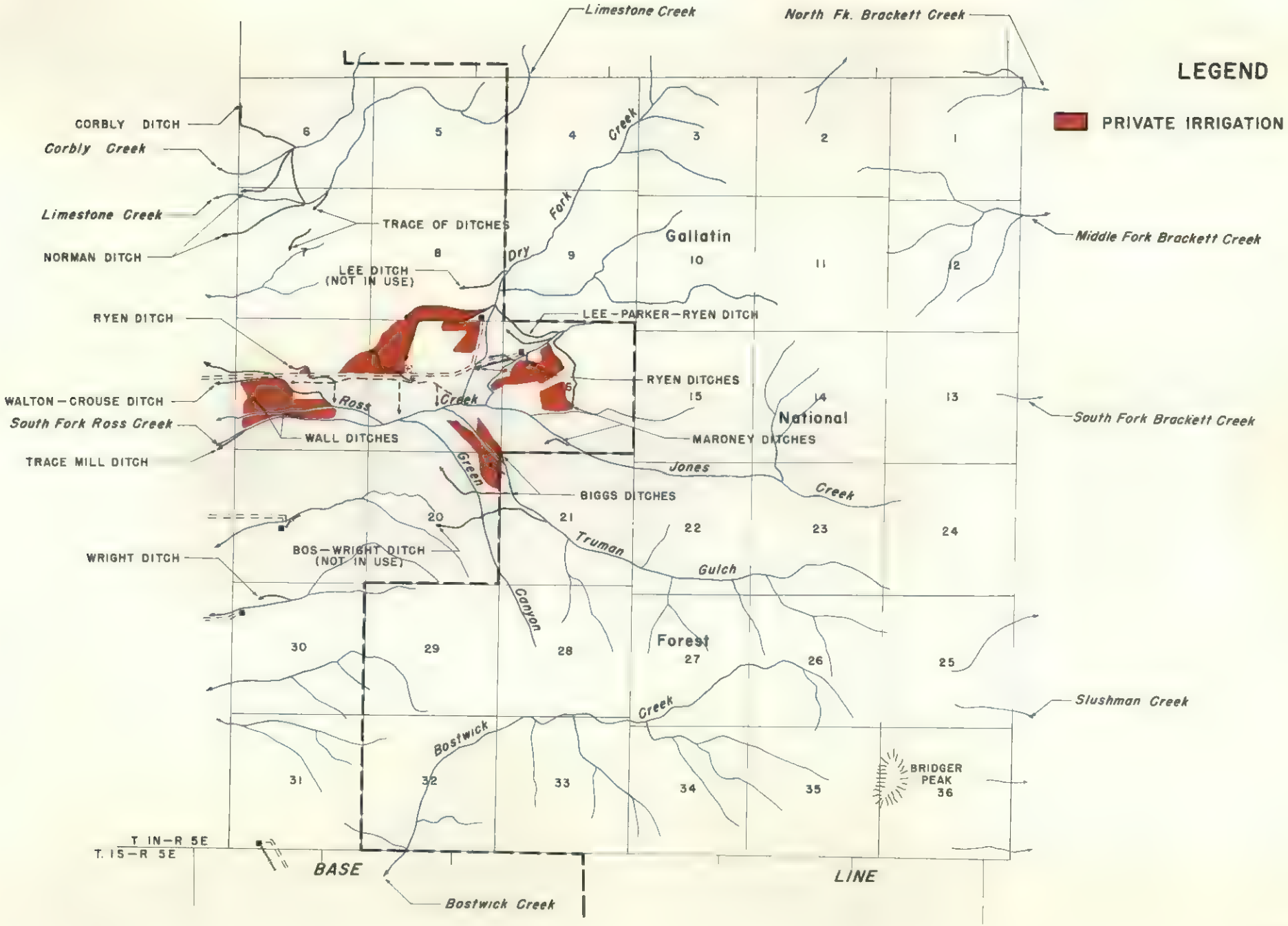
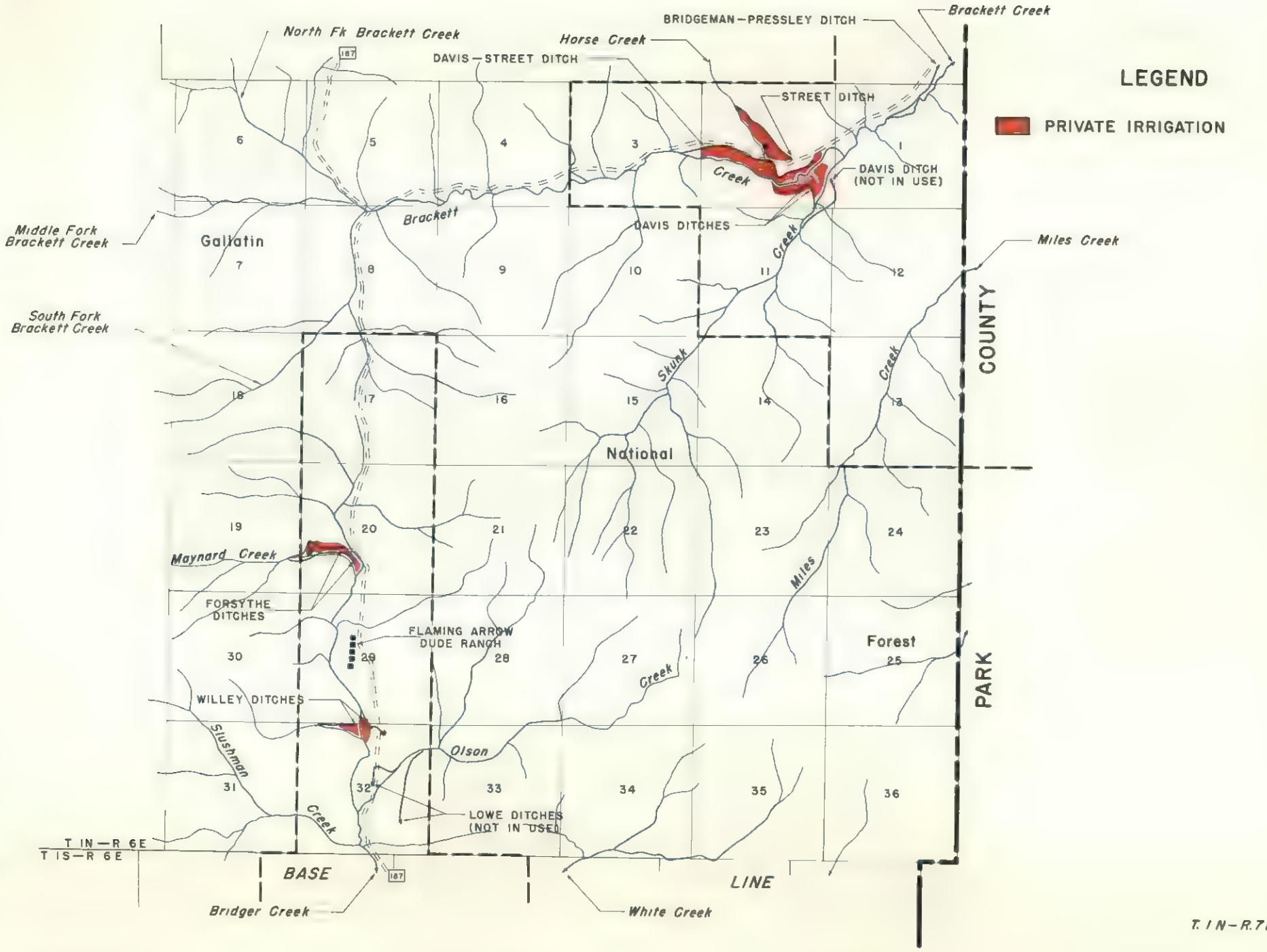
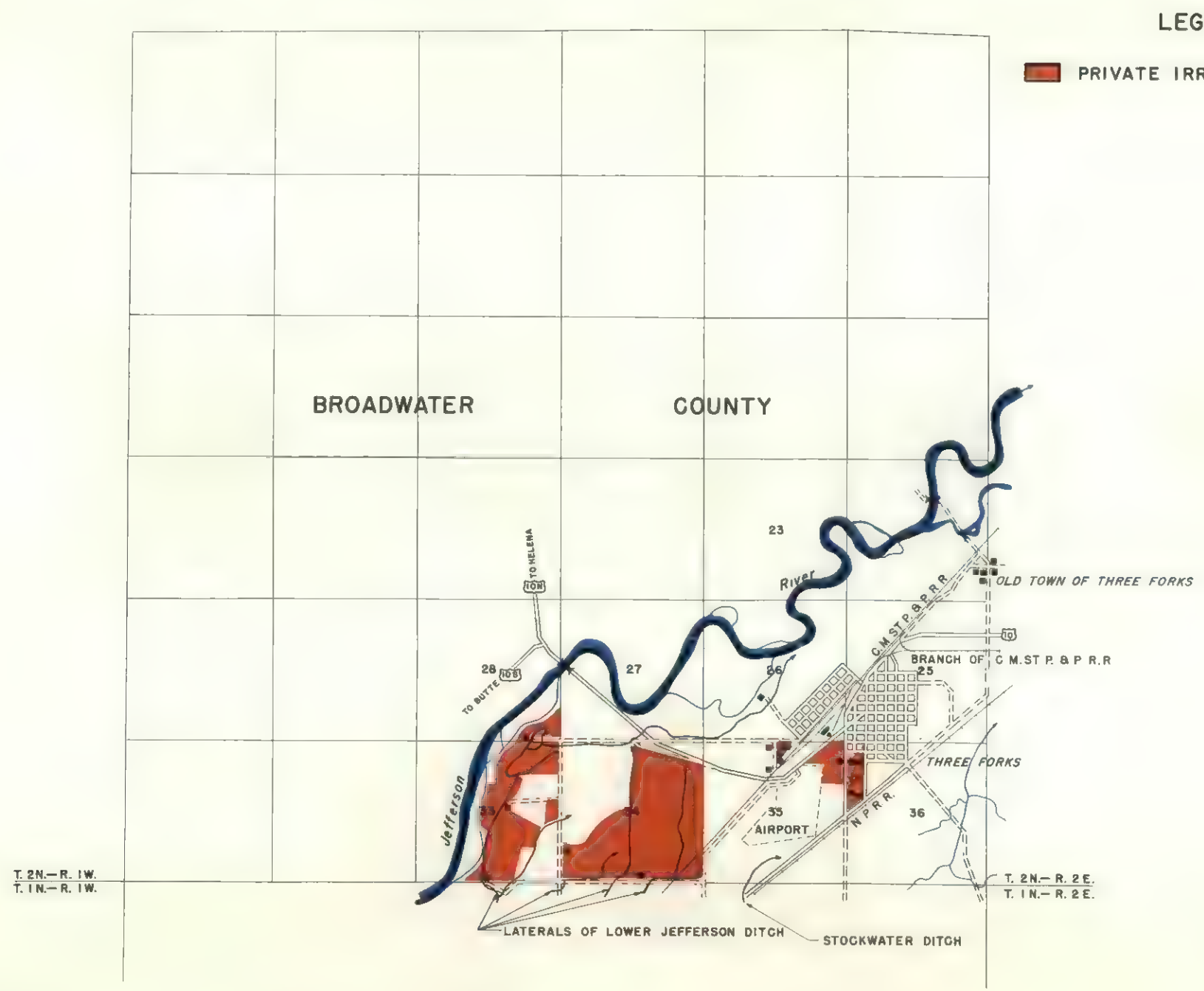

WARM SPRINGS CANAL
C M. ST. P. & P. R.R.
NOT IN USE
BEYOND HERE
BAKER DITCH
N. P R.R.
PERKS CANAL
(LATERALS)
Randall Creek
N P R.R.
West Gallatin River
CARMACH DITCH
(NOT IN USE)
LEGEND
BAKER DITCH CO.
LOW LINE CANAL CO.
WARM SPRINGS CANAL CO.
PRIVATE IRRIGATION
TRACE OF DITCH
END OF MORELAND CANAL
STORAGE WELL
TRACE OF DITCH
MANHATTAN
SPILL
GIBSON DITCH
TOWNSEND DITCHES
West Gallatin River
SPILL
WASTE
DITCH
END OF LOW LINE CANAL
SUPPLY DITCH
WATER DRAIN
SPILL
LEADBEATER DITCH
WRIGHT DITCH
PERKS DITCH
N P R R.
BAKER DITCH
McCLELLAND DITCH
Spring or Trout Creek
WARM SPRINGS CANAL
PERKS CANAL
TRACE OF BOS DITCH
CRUSE DITCH
(NOW THOMPSON)
Baker Creek
HEEB DITCH
T IN—R 2E
T IS—R 2E
BASE
LINE
Spring Creek
LOW LINE CANAL
LOW LINE CANAL LATERALS
MORELAND CANAL
WHITE DITCH
BOS DITCH
Camp Creek
N.P R R.
LEWIS DITCH
C.M ST P & P.R.R
LEWIS DITCH
T IN—R 3E


LOWER CREAMERY OR BULL RUN DITCH
Spaulding Brook
HEETDERKS DITCHES
Bull Run Creek
BRAINARD DITCHES
DRY CREEK SCHOOL
Cowan or Duck Creek
Gibson Creek
McLEOD DITCHES
SMITH DITCH
Dry Creek
SPILL
COWAN DITCHES
DUNCAN DITCHES
MOORE DITCH
SPILL
CLIFFORD DITCH
N P R R.
SALES DITCHES
BECK DITCH
GIBSON DITCH
EVANS DITCH
West Gallatin River
ELLINGSON DITCH
Ridgely Creek
McLEES DITCH
SINNEMA DITCH
Knox Creek
WRIGHT DITCH
SCHNEITER DITCHES
N P R R.
BAKER DITCH
HESTER DITCHES
CENTRAL PARK
OLD HEEB DITCHES
SPILL
LOWER CREAMERY DITCH
OLD WALTER COOPER CANAL & POND
Baker Creek
HEEB DITCHES
VERWOLF DITCH
TRACE OF MEADOW BROOK DITCH
T. IN.—R. 3E.
T. IS.—R. 3E.
HEEB DITCH
GAIN DITCHES
HEEB—DUFFIN DITCH
CHENEY DITCHES
SALES-ISLAND DITCH
BRYAN-CRAWFORD DITCH
HARRISON DITCHES
BASE
LINE
BELL-DUNLOP DITCH
D.N. HOFFMAN DITCH
J B. WEAVER DITCH
J S HOFFMAN DITCHES
STONE-WEAVER DITCHES
MAMMOTH DITCH
J. B. WEAVER DITCH
T. IN.—R. 5E.
T. IS.—R. 5E.
East
Story
Creek
Gallatin
River
STUCKY DITCH
HOFFMAN DITCH
SPILL
SPILL
SPILL
COIL DRAIN DITCHES
SPILL
HULING DITCH
16
COWAN DITCHES
DAVIS DITCHES
KNADLER DITCH
MONFORTON DITCH (NOT IN USE)
GIBSON DITCH
BOLINGER DRAIN DITCH
HOLDIMAN DITCHES
21
22
24
SMITH DITCH
COPE DITCHES
BARNES DITCHES
UPPER CREAMERY DITCH
27
ALLSOP DITCH
34
Foster Creek
SPILL
DRY CREEK CANAL
BRANCH OF C.M. ST. P. & P. R.R.
Smith Creek
East Gallatin River
BENHART DITCH
Thompson Creek
Benhart Creek
N.P.R R
PRESCOTT DITCHES
MERIDIAN
GUIDE
RIVER
SMITH
LEGEND
DRY CREEK IRRIGATION CO.
HOFFMAN—WEAVER DITCH CO
MAMMOTH DITCH CO.
PRIVATE IRRIGATION
T. IN—R. 4E

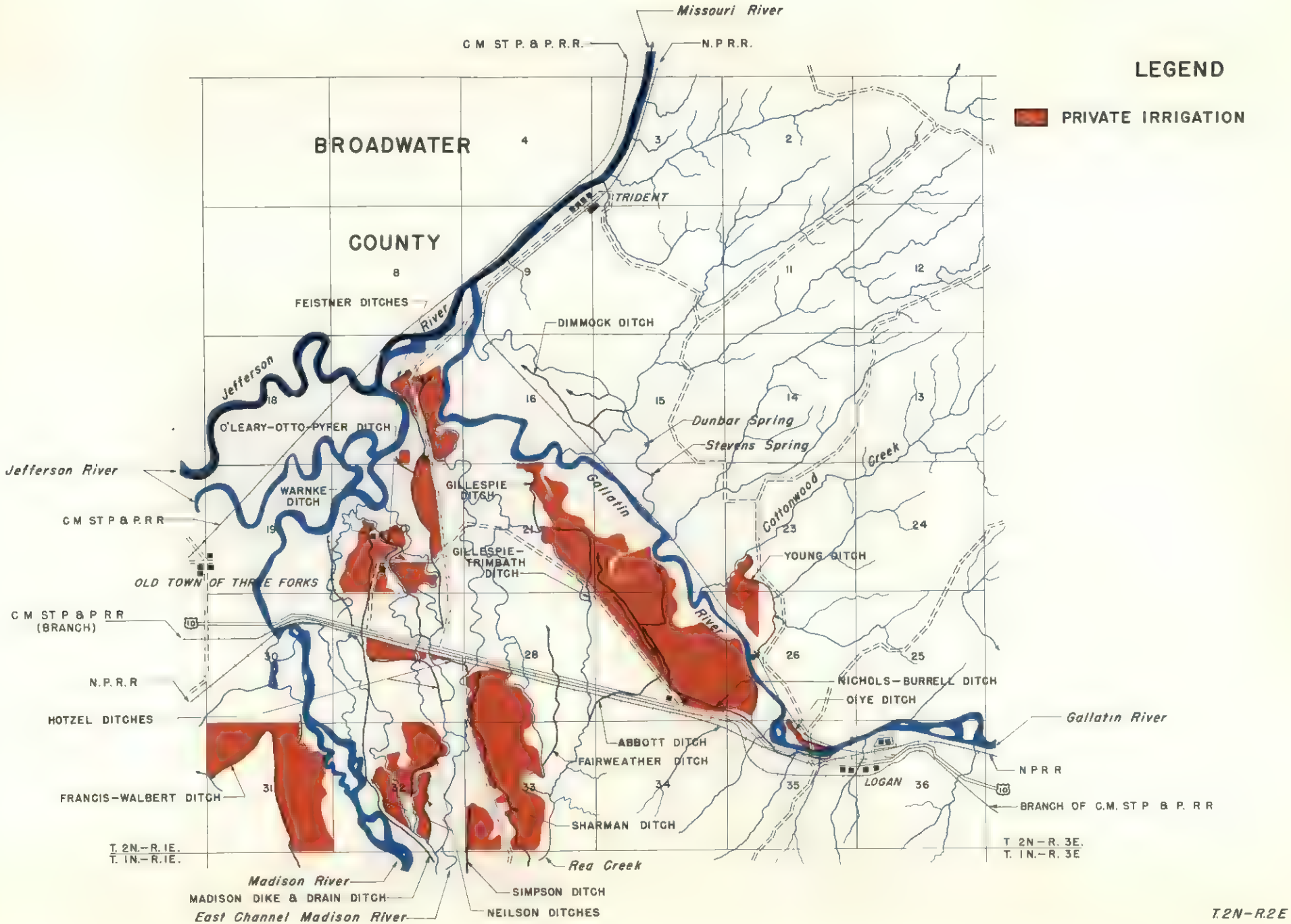

Foster Creek
Hayes Creek
GEE DITCH
Bear Creek
Bill Smith Creek
North Cottonwood Creek
WARWOOD-ESGAR DITCH
Tom Reese Creek
Corbly Creek
REESE DITCHES
EUKES DITCHES
CORBLY DITCHES
TRACE OF DITCHES
MERIDIAN
DRY CREEK CANAL
EUKES-BECKHORN DITCH (NOT IN USE)
C M ST P & P R R
HUFFINE DITCH
AXTELL DITCH
Reese Creek
WALTON-CROUSE DITCH
Limestone Creek
Smith Creek
TRACE
NORMAN DITCHES
NORMAN DITCHES
MELTON DITCH
WELLS DITCH NOT IN USE
SEIFERT DITCHES
GUIDE
TRACE OF DITCH
TRACE OF STREET DITCH
WALTON-CROUSE DITCH
East Gallatin River
SPILL
SPRINGHILL SCHOOL
Thompson Creek
SPILL
HAMILTON DITCH (NOW BRIGHT)
DYK DITCHES
Ross Creek
(OUT)
BRIGHT DITCHES
So. Fk. Ross Creek (BRANCH)
SLACK or GEE-WHITE LATERAL
SPRING DITCH
SUMP
TRACE OF MILL DITCH
AAGARD DITCHES
CARLSON DITCH
RIVER
EAST GALLATIN SCHOOL
GOWIN-LUTZ-McGUIRE DITCH
OLD BELGRADE WATER STORAGE RESERVOIR
OLD BELGRADE WATER CO PIPE LINE
CARLSON-RYEN DITCH
So. Fk. Trout Creek
PARSONS DITCH
SMITH
MAMMOTH DITCH
DECKER DITCHES
N.P.R.R.
Ross Creek
DECKER SCHOOL
TRACE OF STREET DITCH
STIMSON-HEGOX DITCH
PENWELL DITCH
STIMSON DITCH
T 1N-R 4E
T 1S-R 4E
BASE LINE
TRACE OF PENWELL DITCH
Bostwick Creek
C.M. ST. P. & P. R.R.
East Gallatin River
SPAIN-FERRIS DITCH
Hyalite Creek (MIDDLE)
N.P.R.R.
FLANNERY DITCH
T. 1 N-R. 5 E
LEGEND
DRY CREEK IRRIGATION CO.
MAMMOTH DITCH CO.
SPAIN-FERRIS DITCH CO.
PRIVATE IRRIGATION

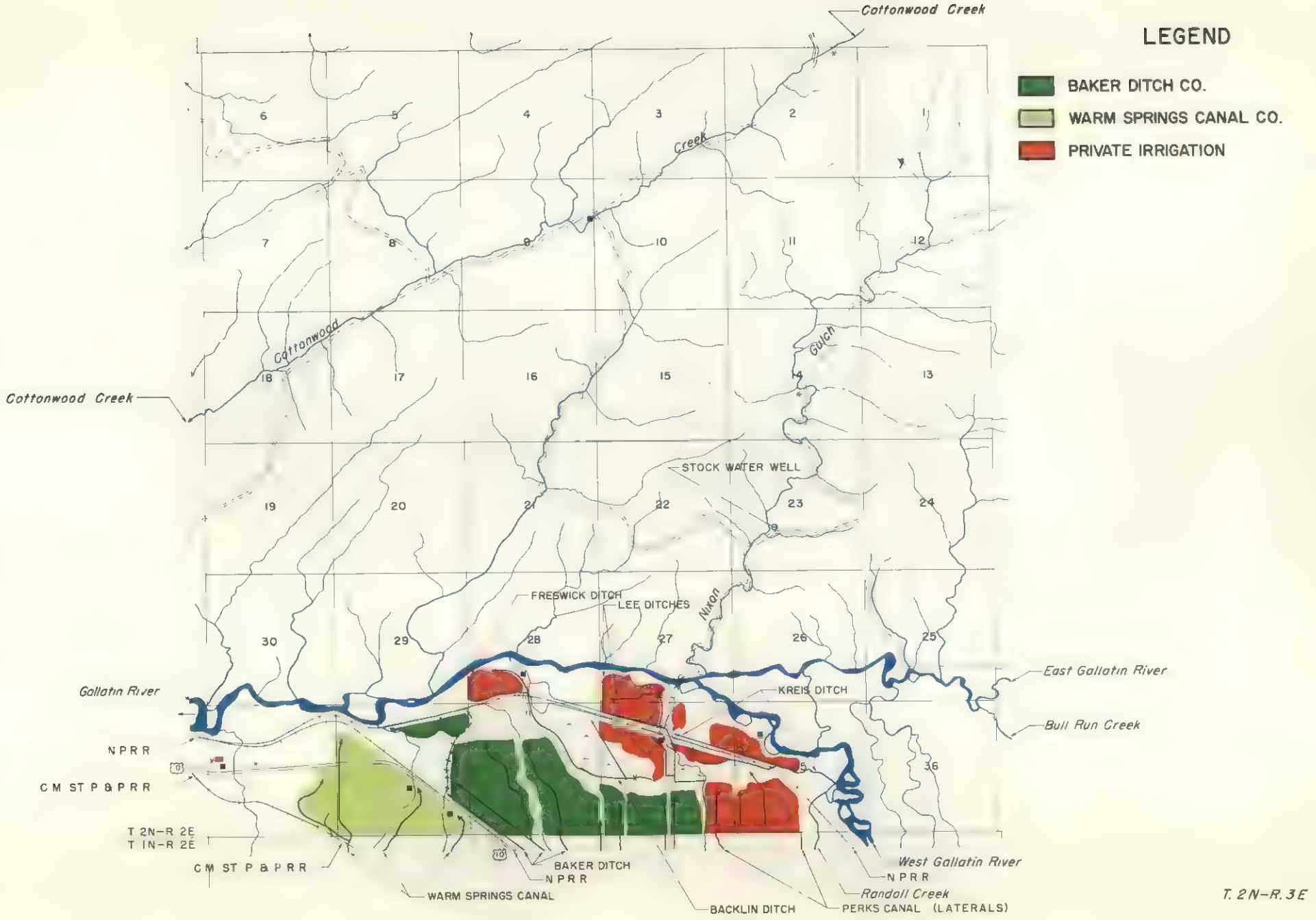

LEGEND
PRIVATE IRRIGATION
Limestone Creek
North Fk. Brackett Creek
CORBLY DITCH
Corbly Creek
Limestone Creek
NORMAN DITCH
TRACE OF DITCHES
LEE DITCH (NOT IN USE)
RYEN DITCH
LEE-PARKER-RYEN DITCH
RYEN DITCHES
WALTON-CROUSE DITCH
South Fork Ross Creek
TRACE MILL DITCH
WALL DITCHES
MARONEY DITCHES
BIGGS DITCHES
WRIGHT DITCH
BOS-WRIGHT DITCH (NOT IN USE)
Middle Fork Brackett Creek
South Fork Brackett Creek
Slushman Creek
Bostwick Creek
Dry Fork
Ross Creek
Green Canyon
Jones Creek
Truman Gulch
Bostwick Creek
Gallatin National Forest
BRIDGER PEAK
T 1N-R 5E
T. 1S-R 5E
BASE LINE
T. 1N-R. 6E

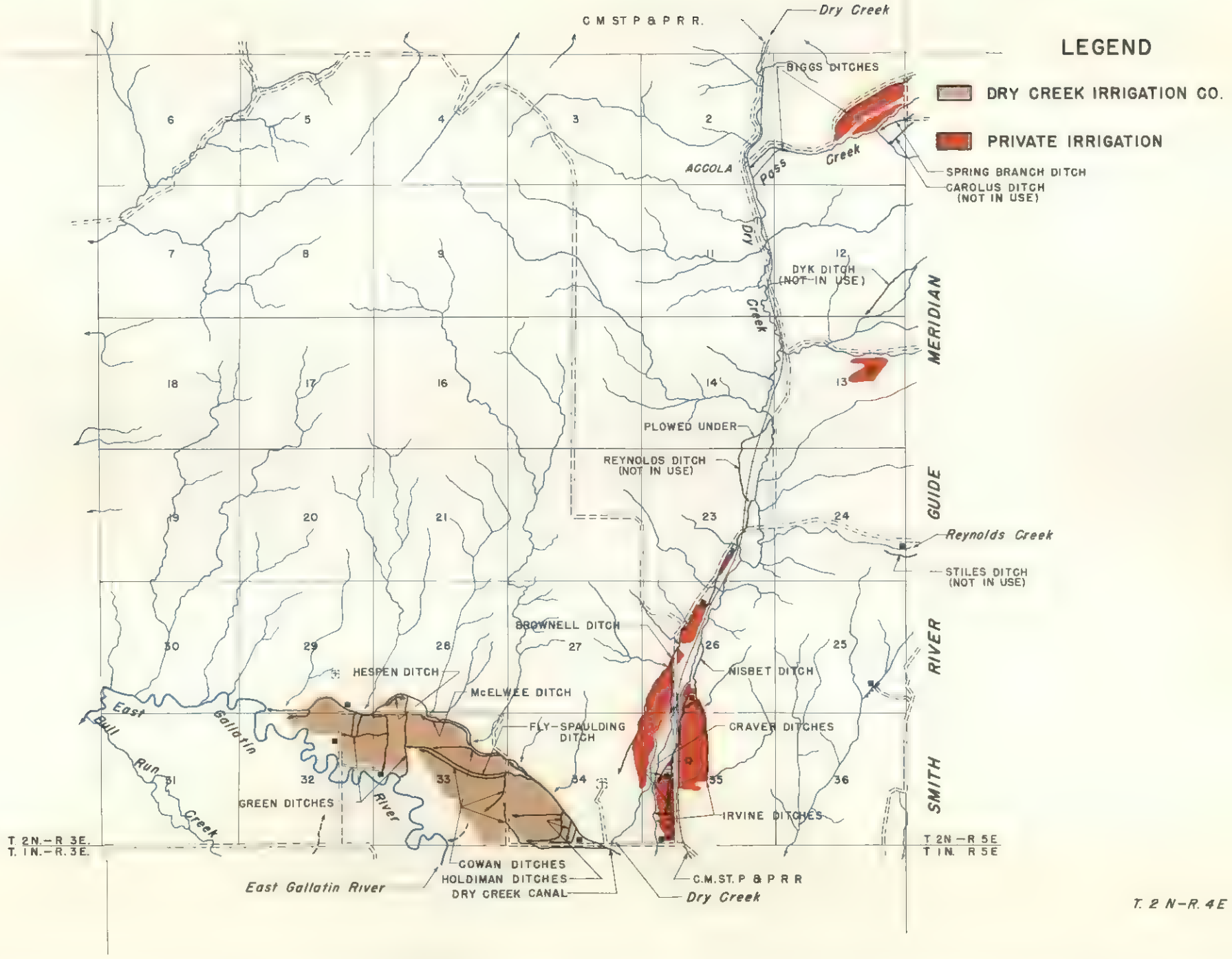

LEGEND
PRIVATE IRRIGATION
North Fk Brackett Creek
Horse Creek
BRIDGEMAN—PRESSLEY DITCH
Brackett Creek
DAVIS—STREET DITCH
STREET DITCH
DAVIS DITCH (NOT IN USE)
DAVIS DITCHES
Middle Fork Brackett Creek
Gallatin
Brackett Creek
Miles Creek
South Fork Brackett Creek
COUNTY
Skunk Creek
National
Maynard Creek
FORSYTHE DITCHES
FLAMING ARROW DUDE RANCH
Miles Creek
Forest
PARK
WILLEY DITCHES
Slushman Creek
Olson Creek
LOWE DITCHES (NOT IN USE)
T 1N—R 6E
T 1S—R 6E
BASE LINE
Bridger Creek
White Creek
T. 1 N—R. 7 E

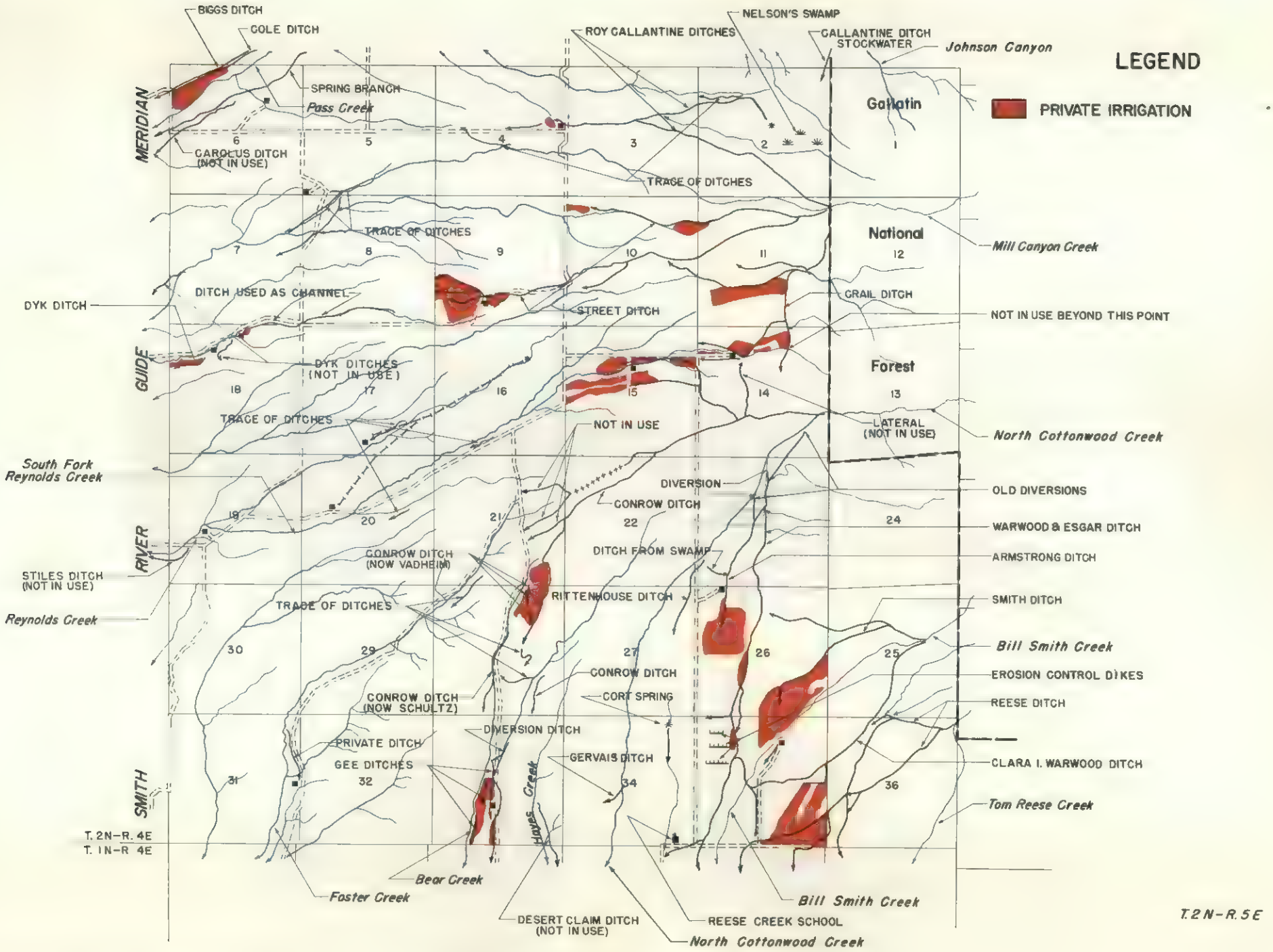

LEGEND
PRIVATE IRRIGATION
BROADWATER
COUNTY
TO HELENA
10N
TO BUTTE
10S
28
27
26
23
25
35
36
33
Jefferson
River
C.M.ST.P.&P.R.R.
OLD TOWN OF THREE FORKS
BRANCH OF C.M.ST.P.&P.R.R
THREE FORKS
N.P.R.R.
AIRPORT
T. 2N.— R. 1W.
T. 1N.— R. 1W.
T. 2N.— R. 2E.
T. 1N.— R. 2E.
LATERALS OF LOWER JEFFERSON DITCH
STOCKWATER DITCH

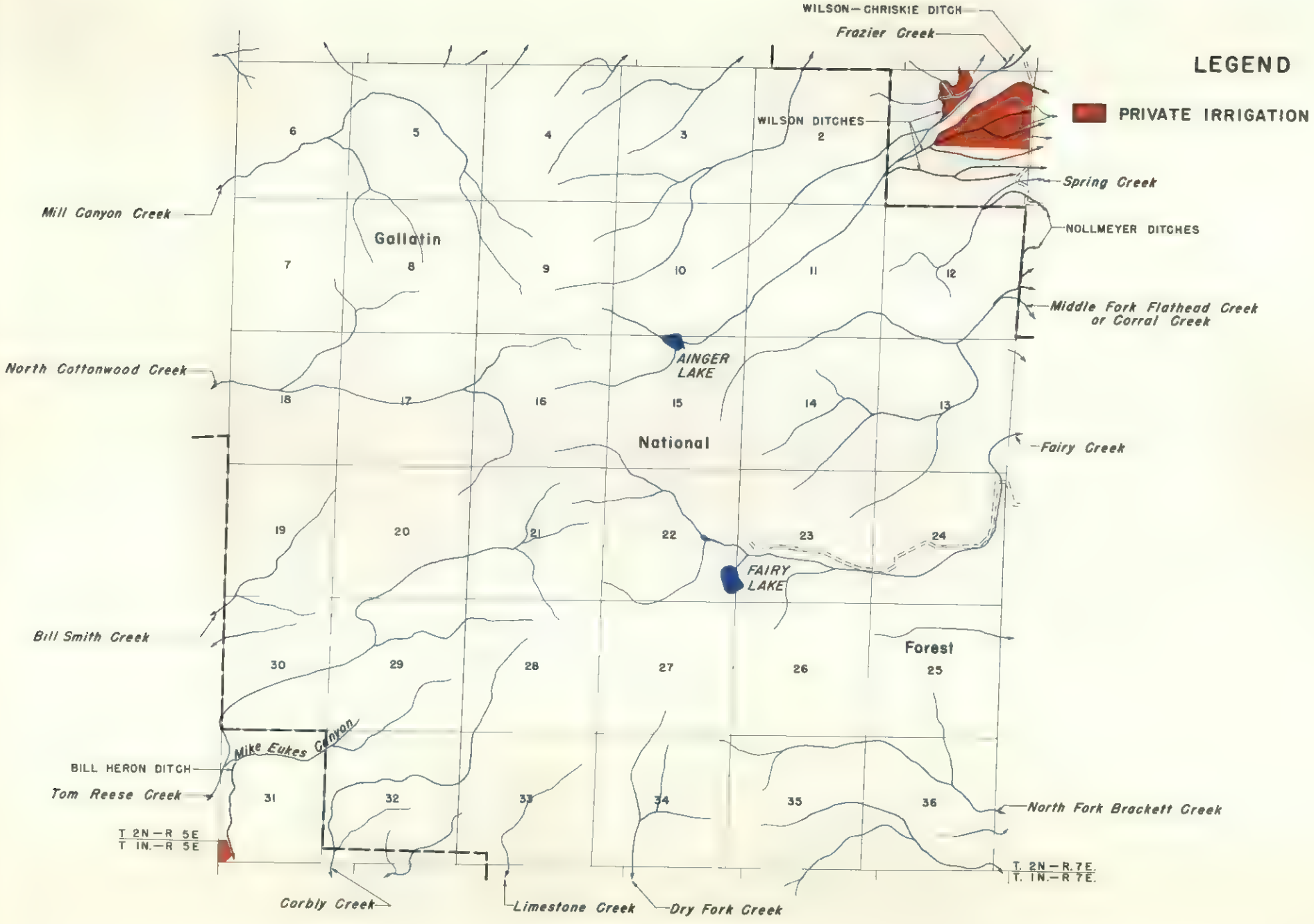
T 2 N—R. 1 E

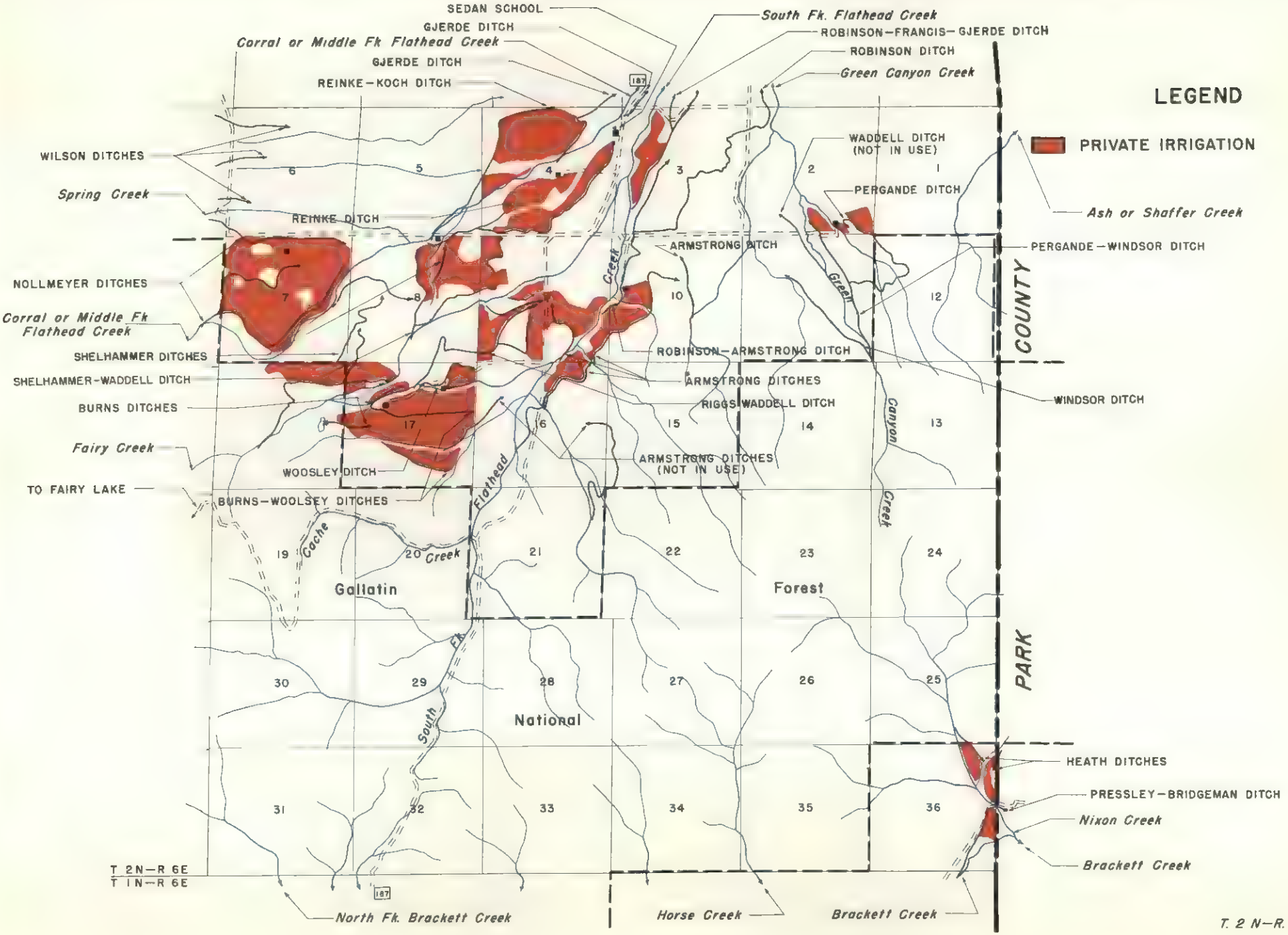

Missouri River
C M ST P. & P. R.R.
N.P.R.R.
LEGEND
PRIVATE IRRIGATION
BROADWATER
COUNTY
TRIDENT
FEISTNER DITCHES
DIMMOCK DITCH
Jefferson River
O'LEARY-OTTO-PYFER DITCH
Dunbar Spring
Stevens Spring
Cottonwood Creek
Jefferson River
WARNKE DITCH
GILLESPIE DITCH
Gallatin River
C M ST P & P R R
GILLESPIE-TRIMBATH DITCH
YOUNG DITCH
OLD TOWN OF THREE FORKS
C M ST P & P R R (BRANCH)
N.P.R.R
NICHOLS-BURRELL DITCH
O'YE DITCH
HOTZEL DITCHES
Gallatin River
ABBOTT DITCH
FAIRWEATHER DITCH
N P R R
LOGAN
FRANCIS-WALBERT DITCH
BRANCH OF C.M. ST P & P. R R
SHARMAN DITCH
T. 2N.-R.1E.
T. 1N.-R.1E.
T 2N-R. 3E.
T. 1N.-R. 3E
Madison River
Rea Creek
MADISON DIKE & DRAIN DITCH
SIMPSON DITCH
East Channel Madison River
NEILSON DITCHES
T.2N-R.2E

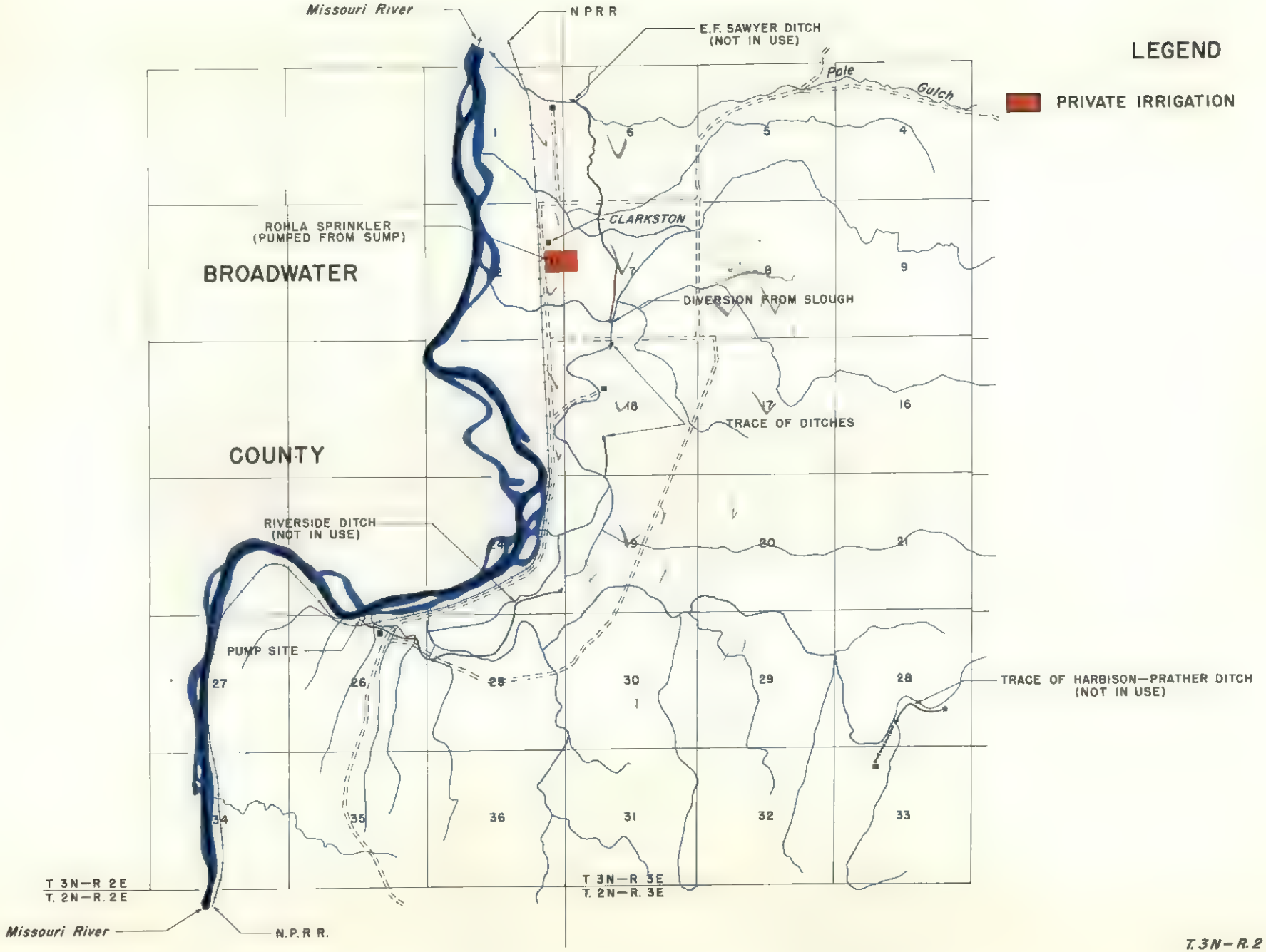

LEGEND
BAKER DITCH CO.
WARM SPRINGS CANAL CO.
PRIVATE IRRIGATION
Cottonwood Creek
Cottonwood Creek
Cottonwood Creek
Cottonwood Gulch
STOCK WATER WELL
FRESWICK DITCH
LEE DITCHES
Nixon
Gallatin River
East Gallatin River
KREIS DITCH
Bull Run Creek
N P R R
C M ST P & P R R
T 2N-R 2E
T 1N-R 2E
C M ST P & P R R
BAKER DITCH
N P R R
WARM SPRINGS CANAL
BACKLIN DITCH
West Gallatin River
N P R R
Randall Creek
PERKS CANAL (LATERALS)
T. 2N-R. 3E

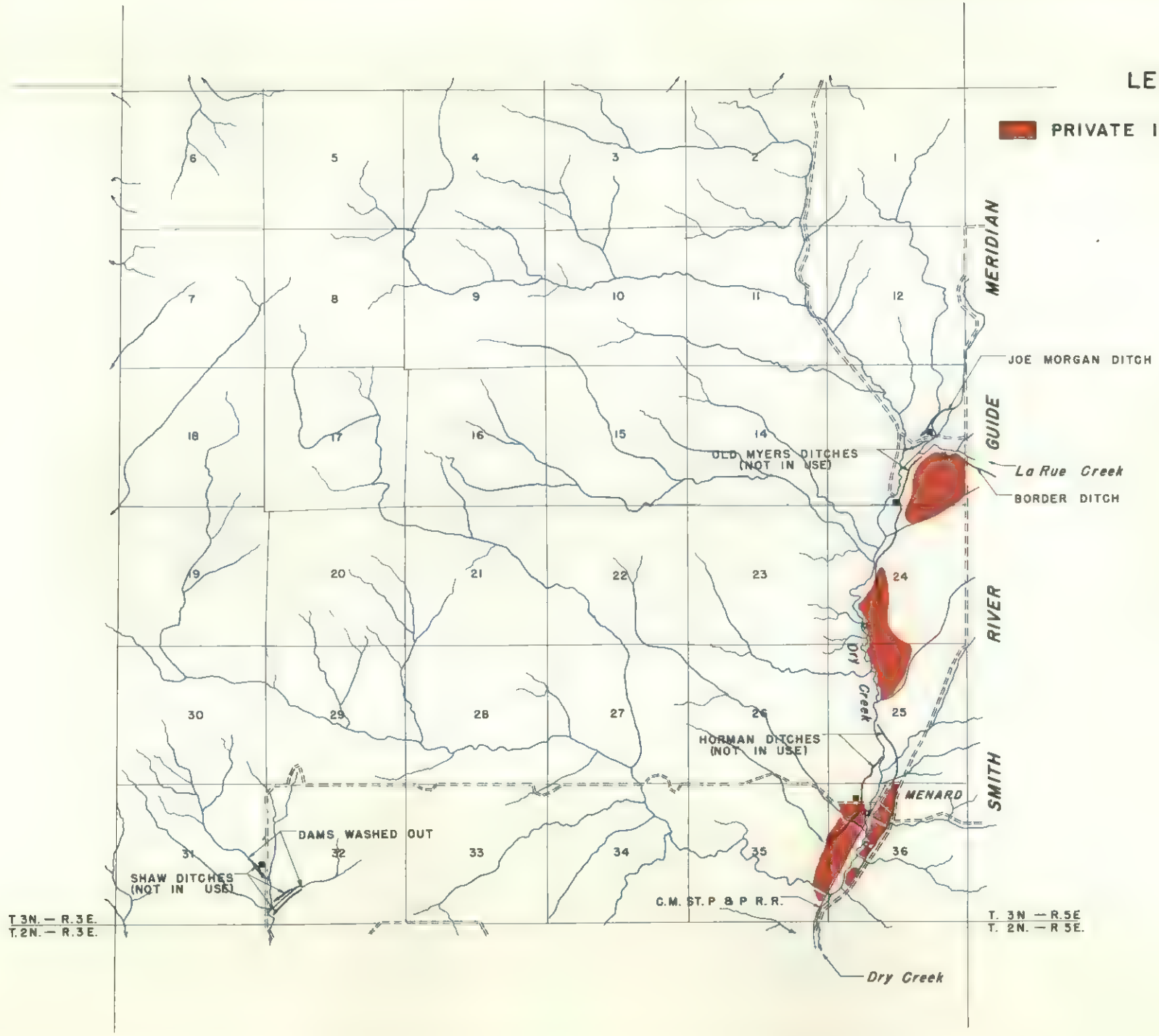

LEGEND
DRY CREEK IRRIGATION CO.
PRIVATE IRRIGATION
C M ST P & P R R.
Dry Creek
BIGGS DITCHES
SPRING BRANCH DITCH
CAROLUS DITCH
(NOT IN USE)
ACCOLA
Pass Creek
Dry Creek
DYK DITCH
(NOT IN USE)
PLOWED UNDER
REYNOLDS DITCH
(NOT IN USE)
Reynolds Creek
STILES DITCH
(NOT IN USE)
BROWNELL DITCH
HESPEN DITCH
McELWEE DITCH
FLY-SPAULDING DITCH
NISBET DITCH
CRAVER DITCHES
IRVINE DITCHES
GREEN DITCHES
East Bull Run Creek
East Gallatin River
River
COWAN DITCHES
HOLDIMAN DITCHES
DRY CREEK CANAL
C.M.ST.P & P R R
Dry Creek
T 2N.—R 3E.
T 1N.—R 3E.
T 2N—R 5E
T 1N. R 5E
MERIDIAN
GUIDE
RIVER
SMITH
T. 2 N—R. 4E


BIGGS DITCH
COLE DITCH
ROY CALLANTINE DITCHES
NELSON'S SWAMP
CALLANTINE DITCH
STOCKWATER
Johnson Canyon
LEGEND
PRIVATE IRRIGATION
SPRING BRANCH
Pass Creek
Gallatin
MERIDIAN
CAROLUS DITCH
(NOT IN USE)
TRACE OF DITCHES
TRACE OF DITCHES
National
Mill Canyon Creek
DITCH USED AS CHANNEL
DYK DITCH
STREET DITCH
GRAIL DITCH
NOT IN USE BEYOND THIS POINT
GUIDE
DYK DITCHES
(NOT IN USE)
Forest
TRACE OF DITCHES
NOT IN USE
LATERAL
(NOT IN USE)
North Cottonwood Creek
South Fork
Reynolds Creek
DIVERSION
OLD DIVERSIONS
CONROW DITCH
WARWOOD & ESGAR DITCH
RIVER
CONROW DITCH
(NOW VADHEIM)
DITCH FROM SWAMP
ARMSTRONG DITCH
STILES DITCH
(NOT IN USE)
RITTENHOUSE DITCH
SMITH DITCH
Reynolds Creek
TRACE OF DITCHES
Bill Smith Creek
EROSION CONTROL DIKES
CONROW DITCH
CONROW DITCH
(NOW SCHULTZ)
CORT SPRING
REESE DITCH
DIVERSION DITCH
PRIVATE DITCH
GERVAIS DITCH
CLARA I. WARWOOD DITCH
GEE DITCHES
SMITH
Hayes Creek
Tom Reese Creek
T. 2N-R. 4E
T. 1N-R 4E
Bear Creek
Foster Creek
Bill Smith Creek
DESERT CLAIM DITCH
(NOT IN USE)
REESE CREEK SCHOOL
North Cottonwood Creek
T.2N-R.5E


WILSON—CHRISKIE DITCH
Frazier Creek
LEGEND
PRIVATE IRRIGATION
WILSON DITCHES
Spring Creek
Mill Canyon Creek
NOLLMEYER DITCHES
Gallatin
Middle Fork Flathead Creek or Corral Creek
AINGER LAKE
North Cottonwood Creek
National
Fairy Creek
FAIRY LAKE
Bill Smith Creek
Forest
Mike Eukes Canyon
BILL HERON DITCH
Tom Reese Creek
North Fork Brackett Creek
T 2N—R 5E
T 1N.—R 5E
T. 2N—R. 7E.
T. 1N.—R 7E.
Corbly Creek
Limestone Creek
Dry Fork Creek
T. 2N—R. 6 E


SEDAN SCHOOL
GJERDE DITCH
Corral or Middle Fk Flathead Creek
GJERDE DITCH
REINKE-KOCH DITCH
WILSON DITCHES
Spring Creek
REINKE DITCH
NOLLMEYER DITCHES
Corral or Middle Fk Flathead Creek
SHELHAMMER DITCHES
SHELHAMMER-WADDELL DITCH
BURNS DITCHES
Fairy Creek
TO FAIRY LAKE
WOOSLEY DITCH
BURNS-WOOLSEY DITCHES
South Fk. Flathead Creek
ROBINSON-FRANCIS-GJERDE DITCH
ROBINSON DITCH
Green Canyon Creek
WADDELL DITCH (NOT IN USE)
PERGANDE DITCH
Ash or Shaffer Creek
PERGANDE-WINDSOR DITCH
ARMSTRONG DITCH
ROBINSON-ARMSTRONG DITCH
ARMSTRONG DITCHES
RIGGS-WADDELL DITCH
ARMSTRONG DITCHES (NOT IN USE)
WINDSOR DITCH
HEATH DITCHES
PRESSLEY-BRIDGEMAN DITCH
Nixon Creek
Brackett Creek
North Fk. Brackett Creek
Horse Creek
Brackett Creek
Cache Creek
Flathead Creek
Green Canyon Creek
South Fk.
Gallatin
Forest
National
COUNTY
PARK
T 2N-R 6E
T 1N-R 6E
T. 2 N-R. 7 E
LEGEND
PRIVATE IRRIGATION


Missouri River
N P R R
E.F. SAWYER DITCH
(NOT IN USE)
Pole
Gulch
LEGEND
PRIVATE IRRIGATION
ROHLA SPRINKLER
(PUMPED FROM SUMP)
CLARKSTON
BROADWATER
DIVERSION FROM SLOUGH
TRACE OF DITCHES
COUNTY
RIVERSIDE DITCH
(NOT IN USE)
PUMP SITE
TRACE OF HARBISON—PRATHER DITCH
(NOT IN USE)
T 3N—R 2E
T. 2N—R. 2E
T 3N—R 3E
T. 2N—R. 3E
Missouri River
N.P.R R.
T.3N—R.2 & 3E


LEGEND
PRIVATE IRRIGATION
MERIDIAN
GUIDE
RIVER
SMITH
JOE MORGAN DITCH
La Rue Creek
BORDER DITCH
OLD MYERS DITCHES (NOT IN USE)
HORMAN DITCHES (NOT IN USE)
Dry Creek
MENARD
DAMS WASHED OUT
SHAW DITCHES (NOT IN USE)
C.M. ST. P & P R.R.
T 3N. — R.3E.
T.2N. — R.3E.
T. 3N — R.5E
T. 2N. — R 5E.
T.3N-R.4E
1
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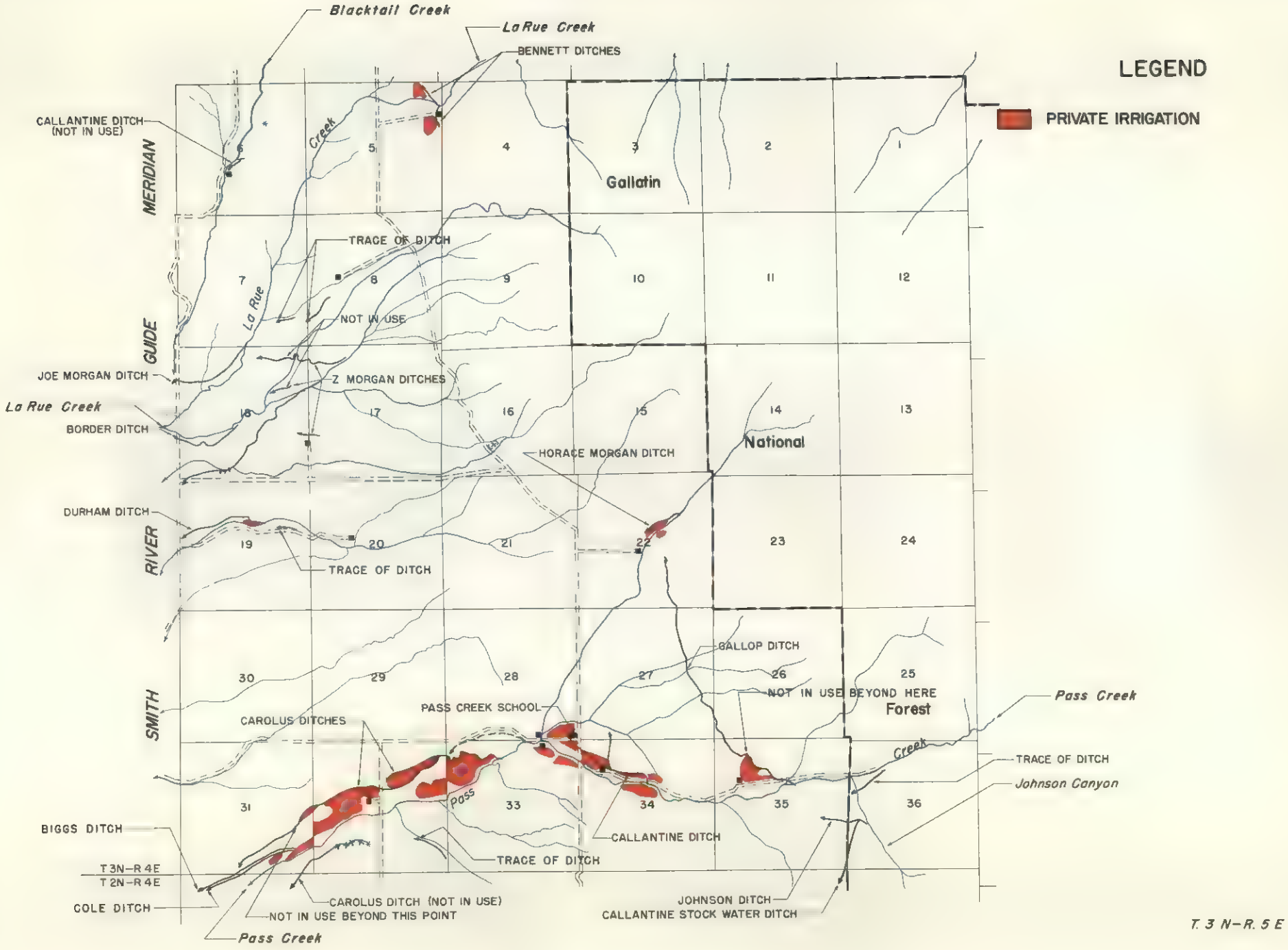
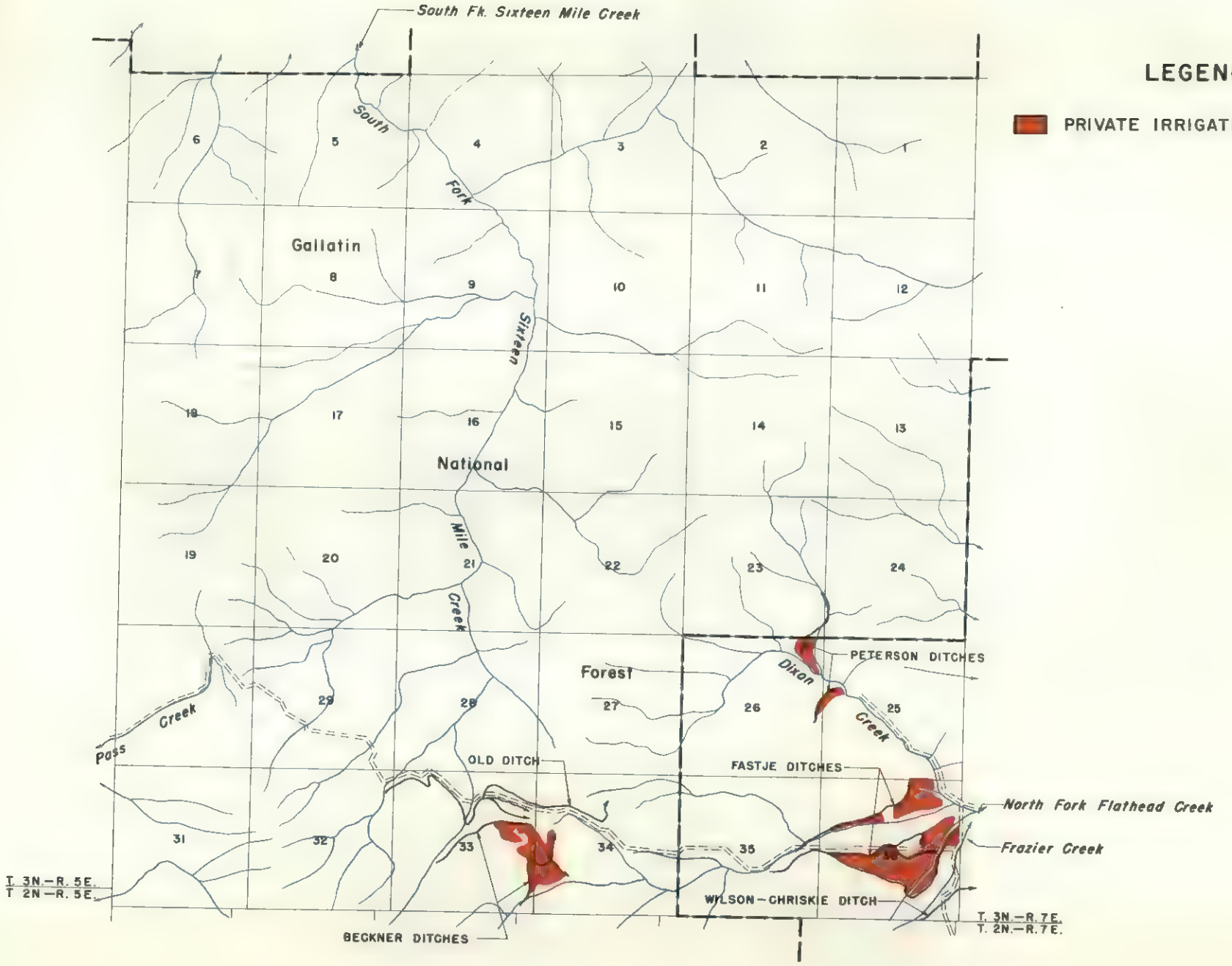
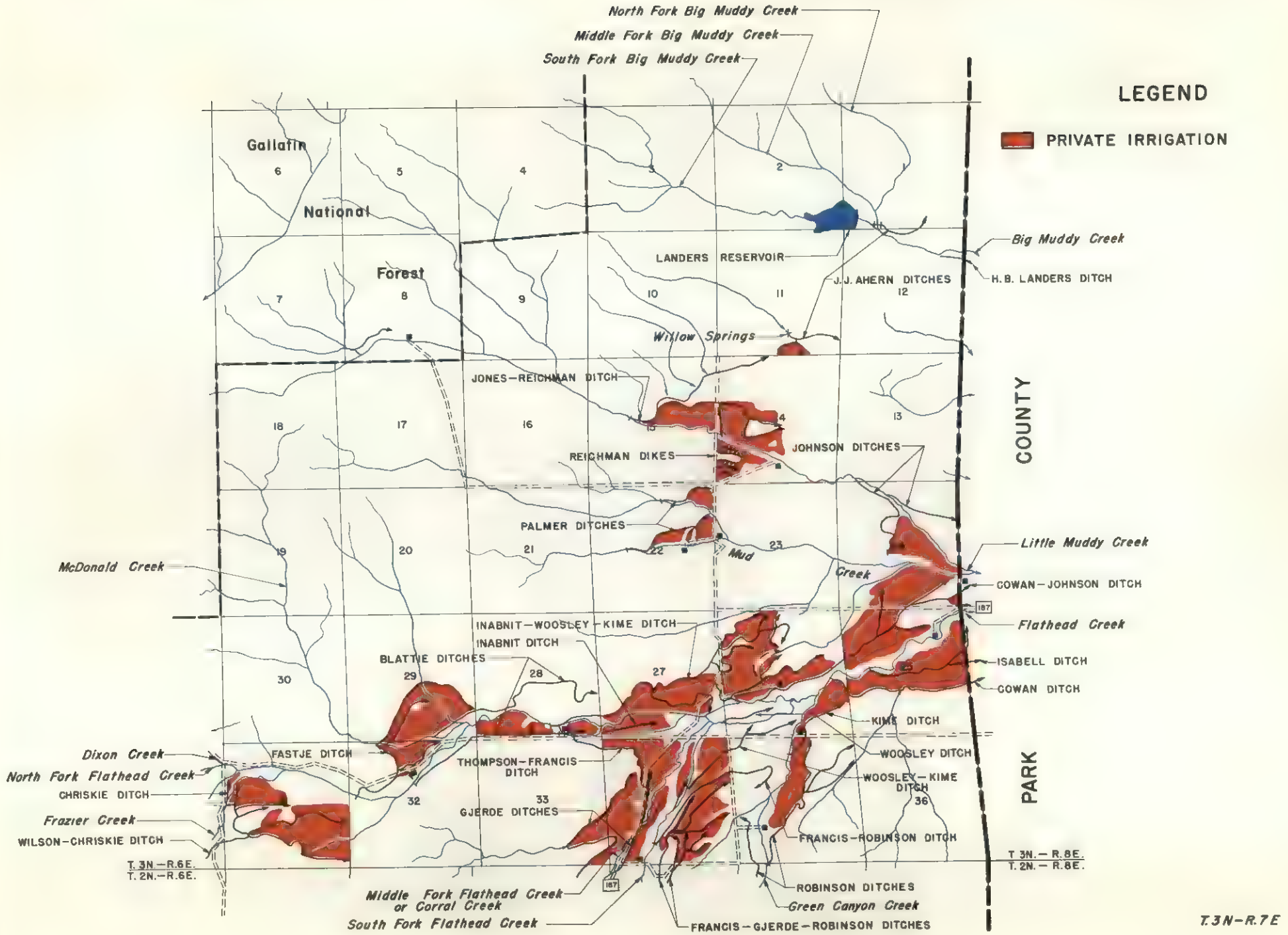
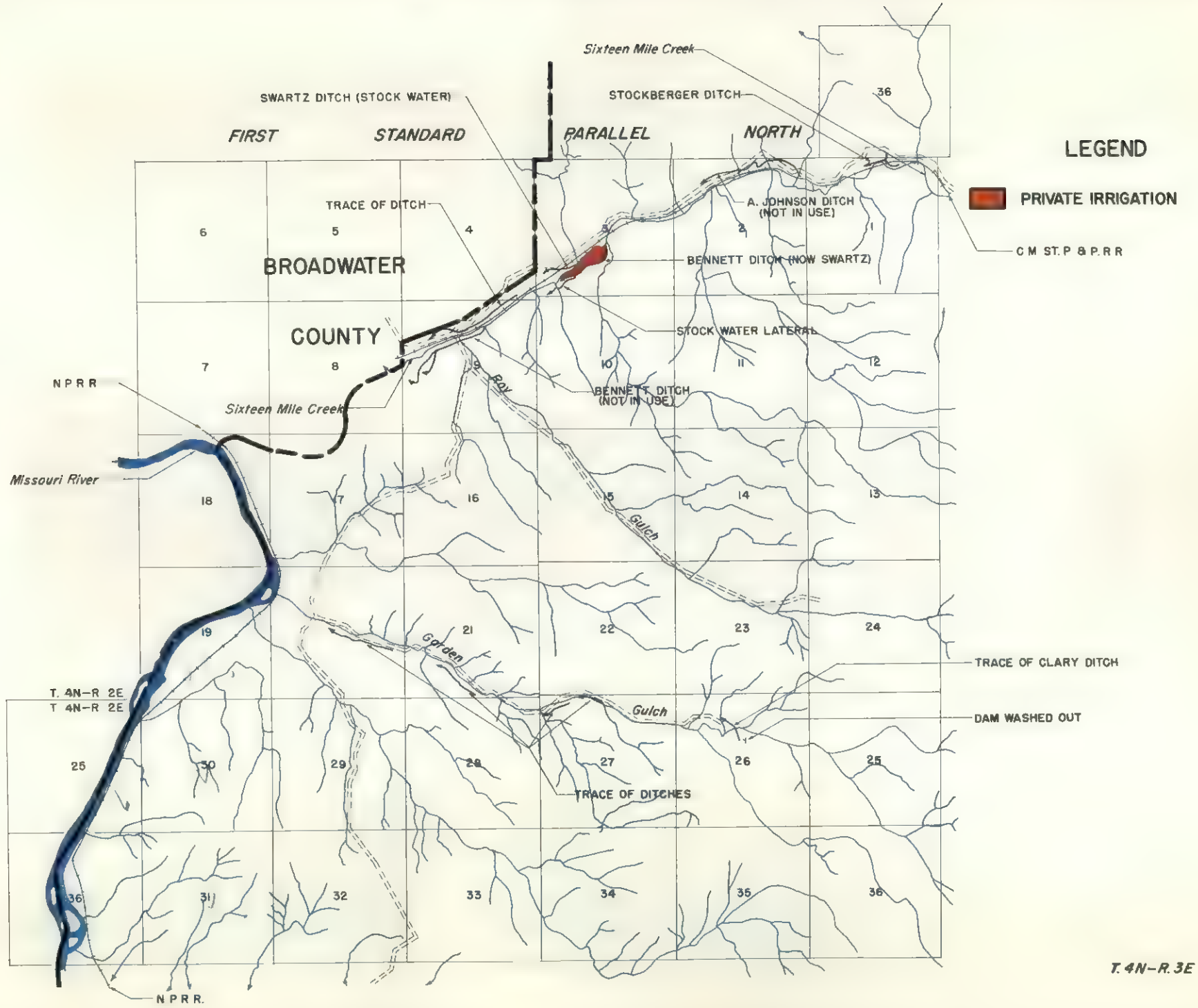
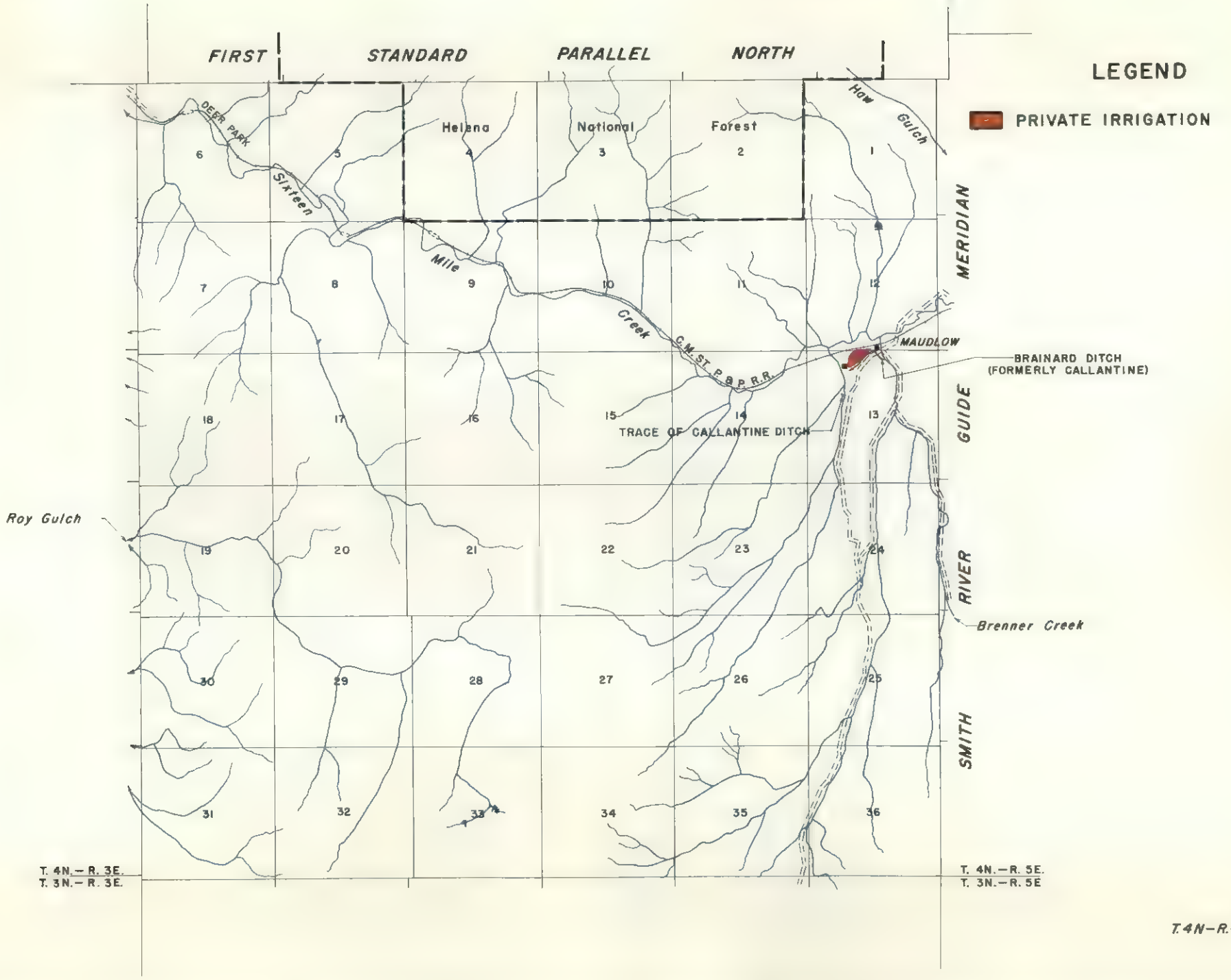
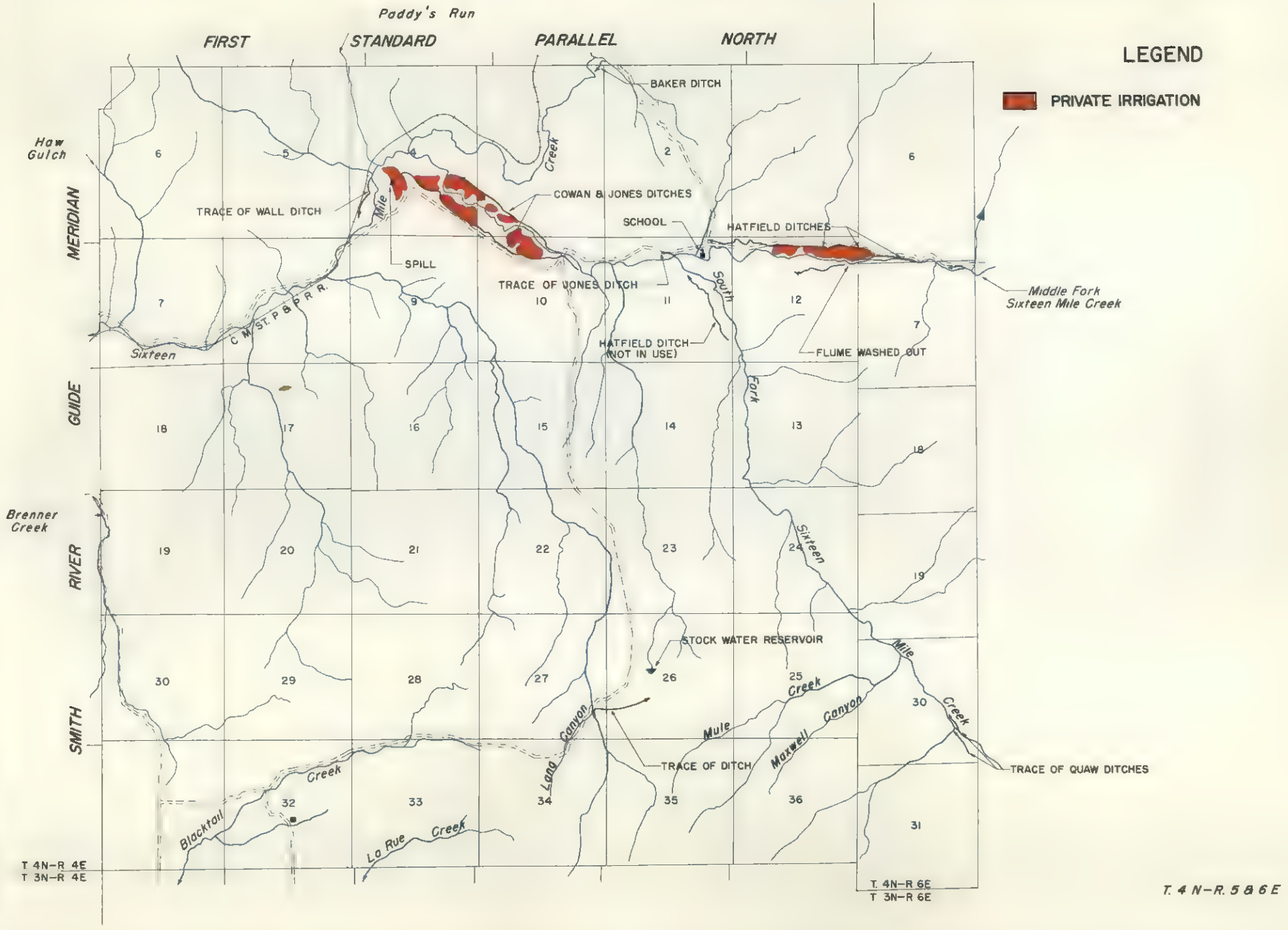

Blacktail Creek
La Rue Creek
BENNETT DITCHES
CALLANTINE DITCH (NOT IN USE)
MERIDIAN
GUIDE
RIVER
SMITH
Gallatin
National
Forest
TRACE OF DITCH
NOT IN USE
JOE MORGAN DITCH
Z MORGAN DITCHES
La Rue Creek
BORDER DITCH
HORACE MORGAN DITCH
DURHAM DITCH
TRACE OF DITCH
GALLOP DITCH
NOT IN USE BEYOND HERE
PASS CREEK SCHOOL
CAROLUS DITCHES
Pass Creek
TRACE OF DITCH
Johnson Canyon
BIGGS DITCH
CALLANTINE DITCH
TRACE OF DITCH
T3N-R4E
T2N-R4E
COLE DITCH
CAROLUS DITCH (NOT IN USE)
NOT IN USE BEYOND THIS POINT
Pass Creek
JOHNSON DITCH
CALLANTINE STOCK WATER DITCH
LEGEND
PRIVATE IRRIGATION
T. 3 N-R. 5 E

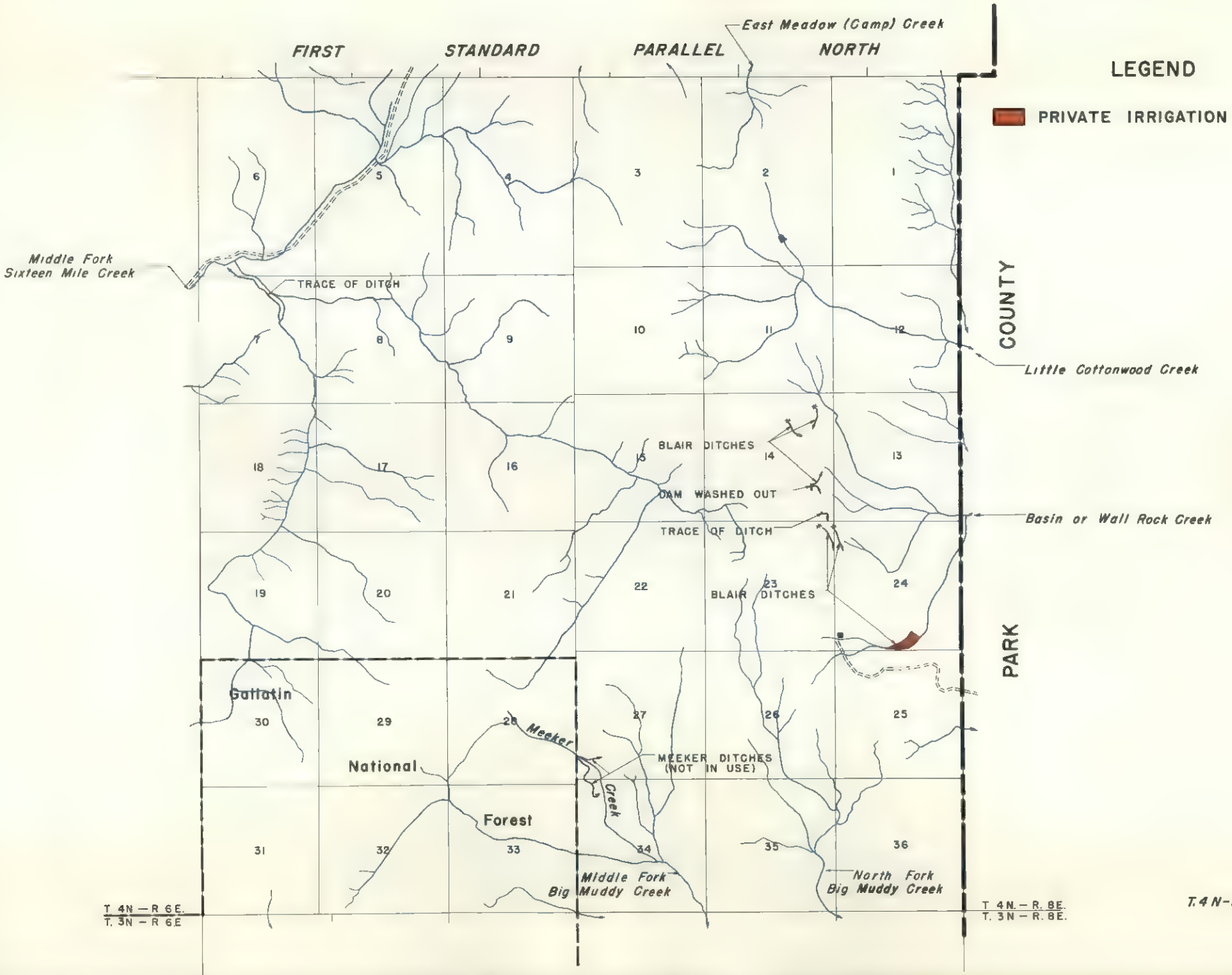

South Fk. Sixteen Mile Creek
South Fork
Gallatin
National
Forest
Sixteen Mile Creek
Dixon Creek
Pass Creek
PETERSON DITCHES
OLD DITCH
FASTJE DITCHES
North Fork Flathead Creek
Frazier Creek
WILSON-CHRISKIE DITCH
BECKNER DITCHES
T. 3N.-R. 5E.
T 2N-R. 5E.
T. 3N.-R. 7E.
T. 2N.-R. 7E.
LEGEND
PRIVATE IRRIGATION
T. 3N-R. 6E

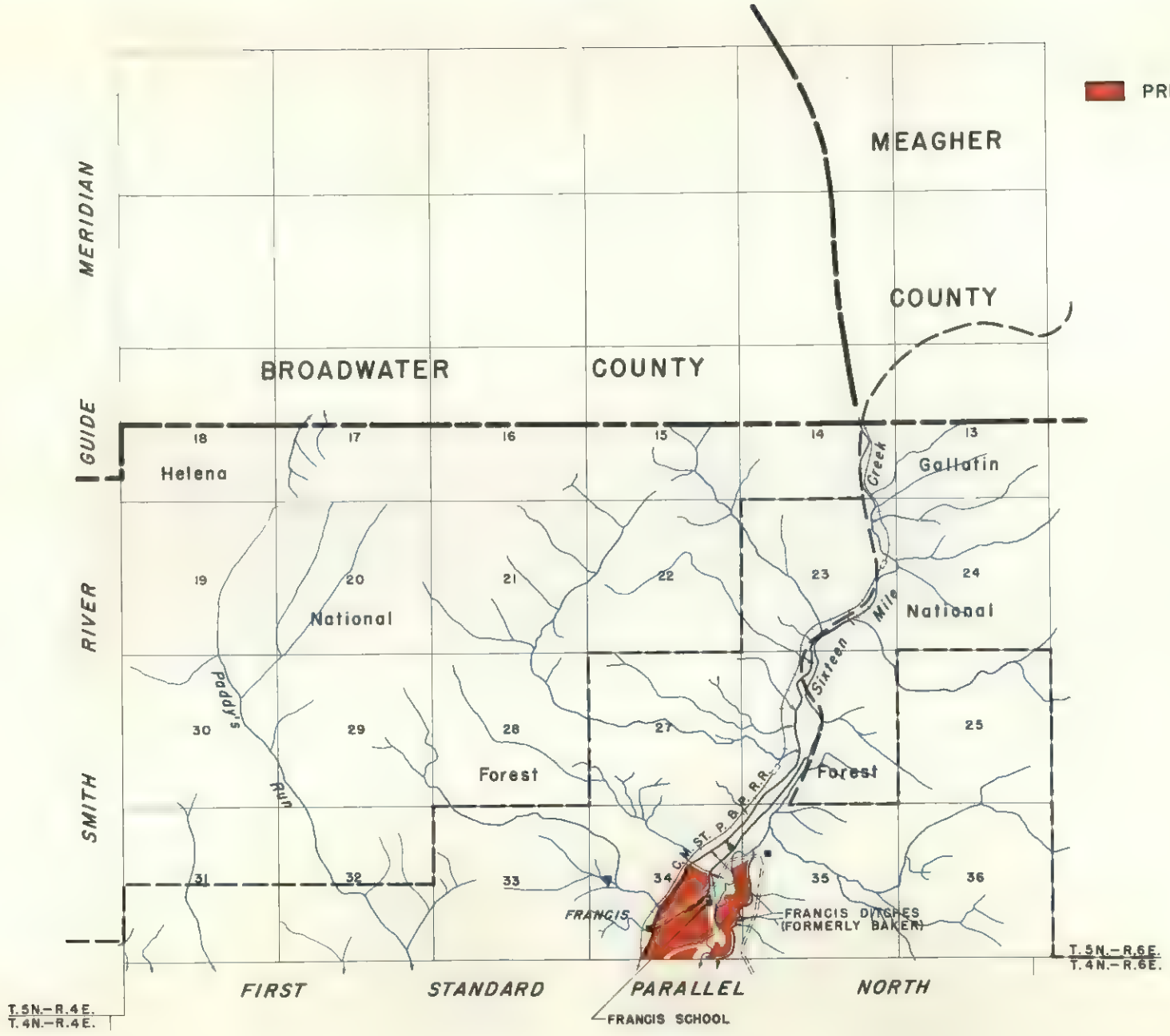

North Fork Big Muddy Creek
Middle Fork Big Muddy Creek
South Fork Big Muddy Creek
LEGEND
PRIVATE IRRIGATION
Gallatin
National
Forest
LANDERS RESERVOIR
Big Muddy Creek
H. B. LANDERS DITCH
J. J. AHERN DITCHES
Willow Springs
JONES—REICHMAN DITCH
REICHMAN DIKES
JOHNSON DITCHES
COUNTY
PALMER DITCHES
Little Muddy Creek
McDonald Creek
Mud Creek
COWAN—JOHNSON DITCH
INABNIT—WOOSLEY—KIME DITCH
INABNIT DITCH
Flathead Creek
BLATTJE DITCHES
ISABELL DITCH
COWAN DITCH
KIME DITCH
Dixon Creek
FASTJE DITCH
THOMPSON—FRANCIS DITCH
WOOSLEY DITCH
North Fork Flathead Creek
WOOSLEY—KIME DITCH
CHRISKIE DITCH
GJERDE DITCHES
Frazier Creek
WILSON—CHRISKIE DITCH
FRANCIS—ROBINSON DITCH
PARK
T. 3N.—R.6E.
T. 2N.—R.6E.
T. 3N.—R.8E.
T. 2N.—R.8E.
Middle Fork Flathead Creek or Corral Creek
South Fork Flathead Creek
ROBINSON DITCHES
Green Canyon Creek
FRANCIS—GJERDE—ROBINSON DITCHES
T.3N—R.7E


Sixteen Mile Creek
SWARTZ DITCH (STOCK WATER)
STOCKBERGER DITCH
FIRST STANDARD PARALLEL NORTH
TRACE OF DITCH
A. JOHNSON DITCH (NOT IN USE)
BROADWATER
COUNTY
BENNETT DITCH (NOW SWARTZ)
C M ST. P & P. R R
STOCK WATER LATERAL
BENNETT DITCH (NOT IN USE)
N P R R
Sixteen Mile Creek
Missouri River
Roy
Gulch
Gorden
Gulch
TRACE OF CLARY DITCH
DAM WASHED OUT
T. 4N–R 2E
T 4N–R 2E
TRACE OF DITCHES
N P R R.
LEGEND
PRIVATE IRRIGATION
T. 4N–R. 3E

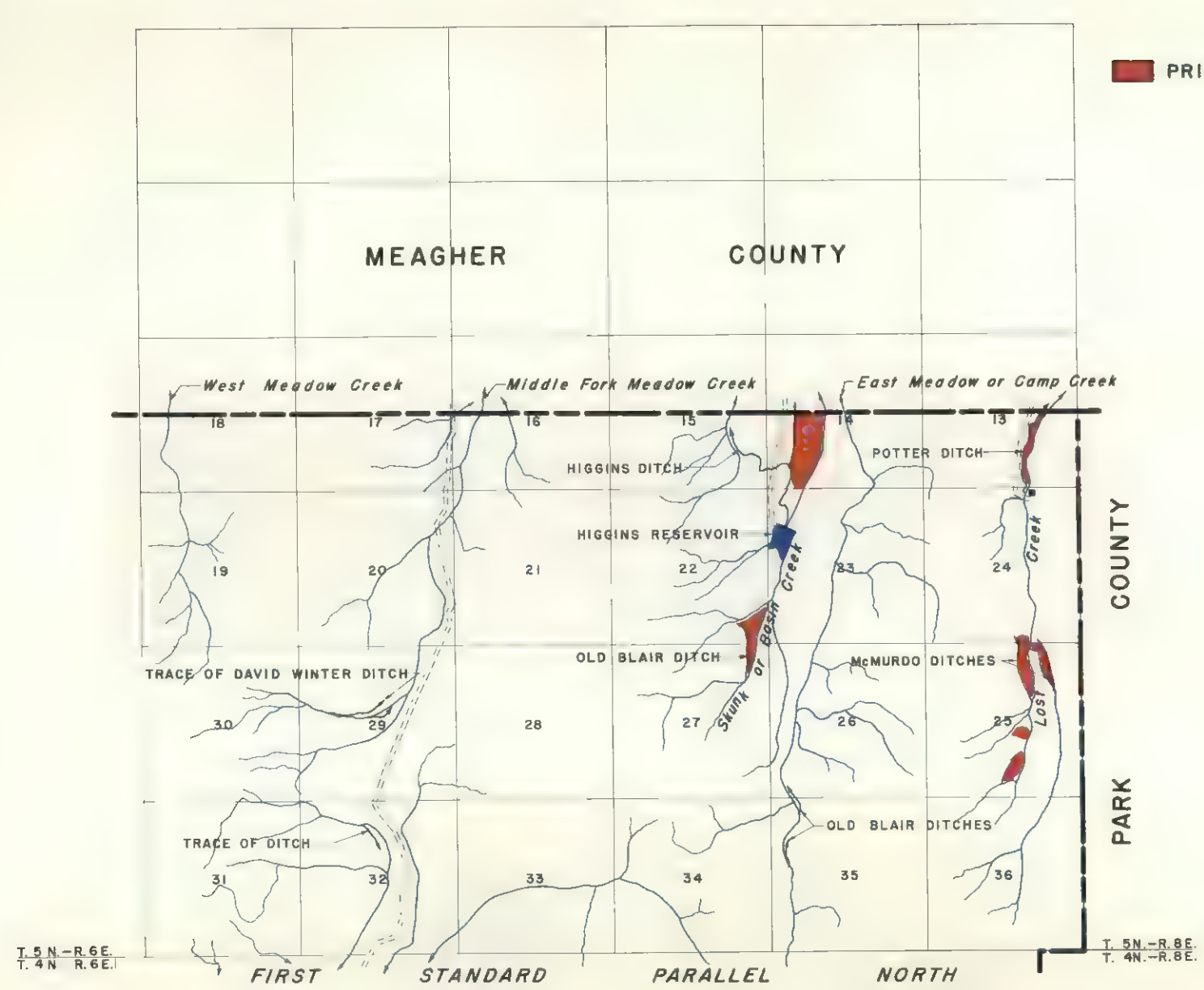

FIRST STANDARD PARALLEL NORTH
Helena National Forest
DEER PARK
Sixteen Mile Creek
How Gulch
C.M.ST.P.&P.R.R.
MAUDLOW
BRAINARD DITCH
(FORMERLY CALLANTINE)
TRACE OF CALLANTINE DITCH
Roy Gulch
Brenner Creek
MERIDIAN
GUIDE
RIVER
SMITH
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36
T. 4N.—R. 3E.
T. 3N.—R. 3E.
T. 4N.—R. 5E.
T. 3N.—R. 5E.
LEGEND
PRIVATE IRRIGATION
T.4N-R.4E


Paddy's Run
FIRST STANDARD PARALLEL NORTH
LEGEND
PRIVATE IRRIGATION
Haw Gulch
MERIDIAN
GUIDE
RIVER
SMITH
Brenner Creek
BAKER DITCH
COWAN & JONES DITCHES
TRACE OF WALL DITCH
SCHOOL
HATFIELD DITCHES
SPILL
TRACE OF JONES DITCH
C.M.ST.P.&P.R.R.
HATFIELD DITCH (NOT IN USE)
FLUME WASHED OUT
Middle Fork Sixteen Mile Creek
Sixteen
STOCK WATER RESERVOIR
TRACE OF DITCH
TRACE OF QUAW DITCHES
Blacktail Creek
La Rue Creek
Land Canyon
Mule Creek
Maxwell Canyon
T 4N-R 4E
T 3N-R 4E
T. 4N-R 6E
T 3N-R 6E
T. 4 N-R. 5 & 6 E

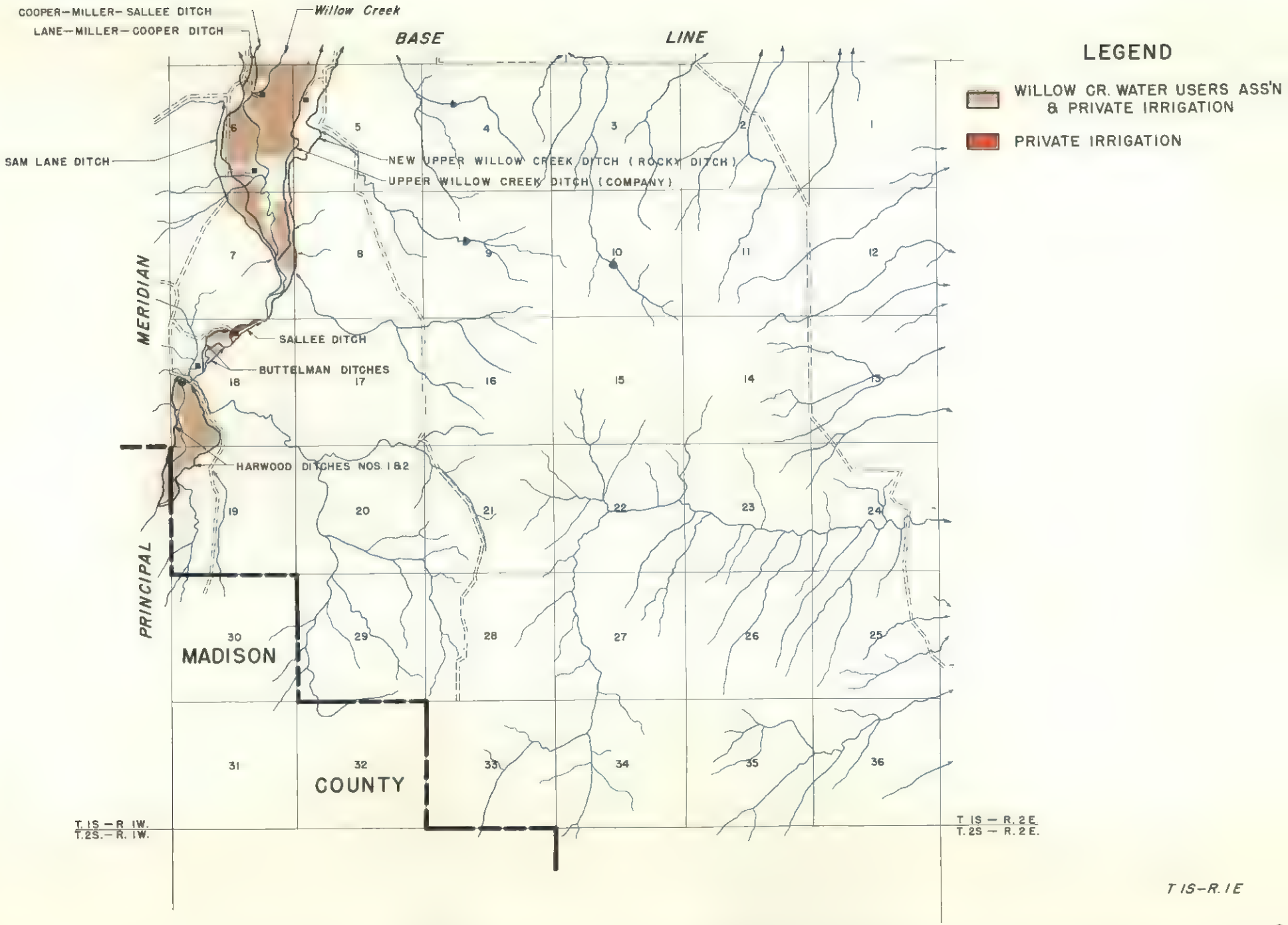

FIRST STANDARD PARALLEL NORTH
East Meadow (Camp) Creek
LEGEND
PRIVATE IRRIGATION
Middle Fork Sixteen Mile Creek
TRACE OF DITCH
COUNTY
Little Cottonwood Creek
BLAIR DITCHES
DAM WASHED OUT
Basin or Wall Rock Creek
TRACE OF DITCH
BLAIR DITCHES
PARK
Gallatin
National
Forest
Meeker
Creek
MEEKER DITCHES (NOT IN USE)
Middle Fork Big Muddy Creek
North Fork Big Muddy Creek
T 4N — R 6E.
T. 3N — R 6E
T 4N. — R. 8E.
T. 3N — R. 8E.
T.4N-R.7E

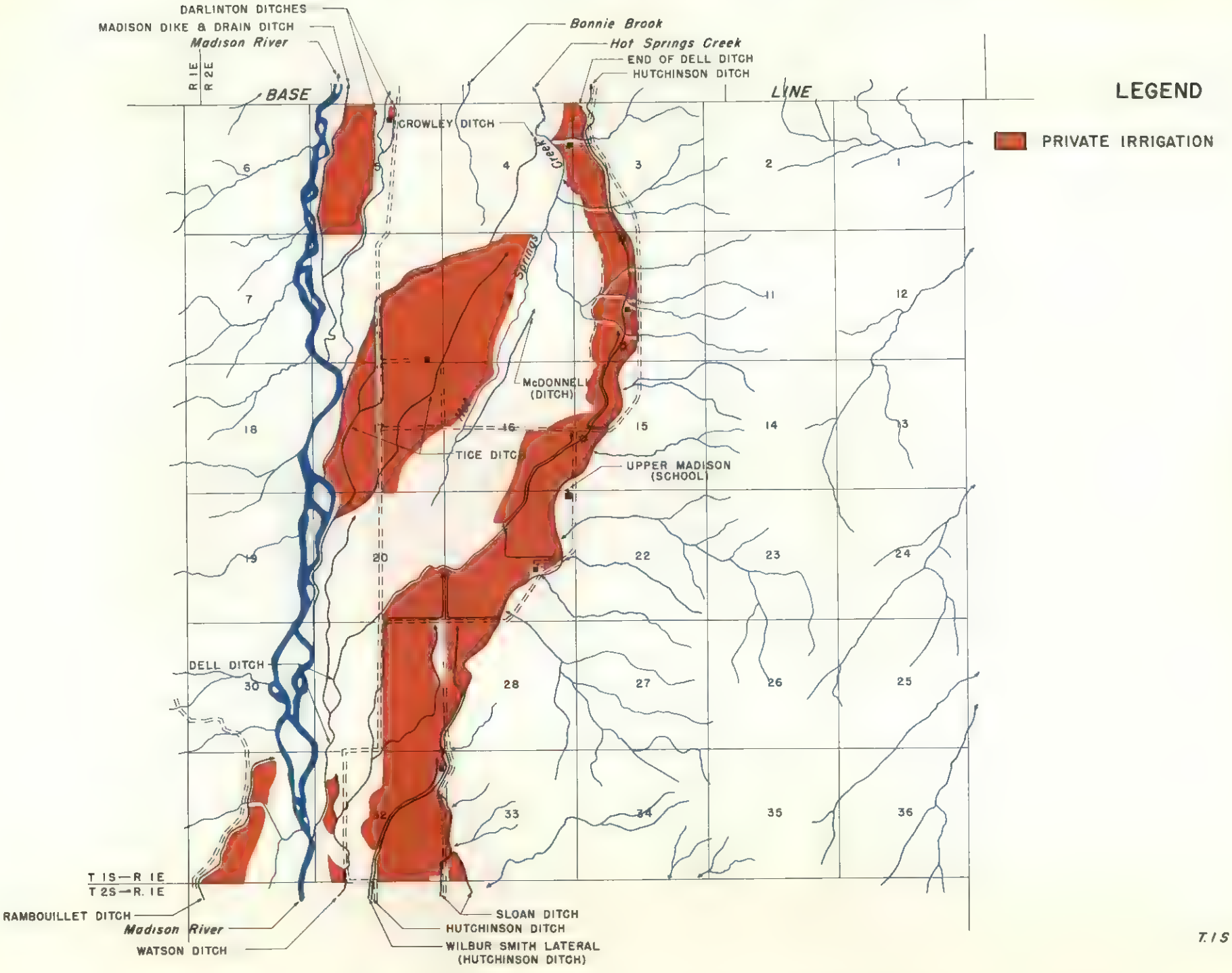

LEGEND
PRIVATE IRRIGATION
MEAGHER
COUNTY
BROADWATER
COUNTY
GUIDE
MERIDIAN
RIVER
SMITH
Helena
Gallatin
National
National
Forest
Forest
Creek
Mile
Sixteen
Paddy's
Run
C.M.ST.P.&P.R.R.
FRANCIS
FRANCIS DITCHES
(FORMERLY BAKER)
FRANCIS SCHOOL
18
17
16
15
14
13
19
20
21
22
23
24
30
29
28
27
25
31
32
33
34
35
36
T.5N.–R.4E.
T.4N.–R.4E.
T.5N.–R.6E.
T.4N.–R.6E.
FIRST
STANDARD
PARALLEL
NORTH

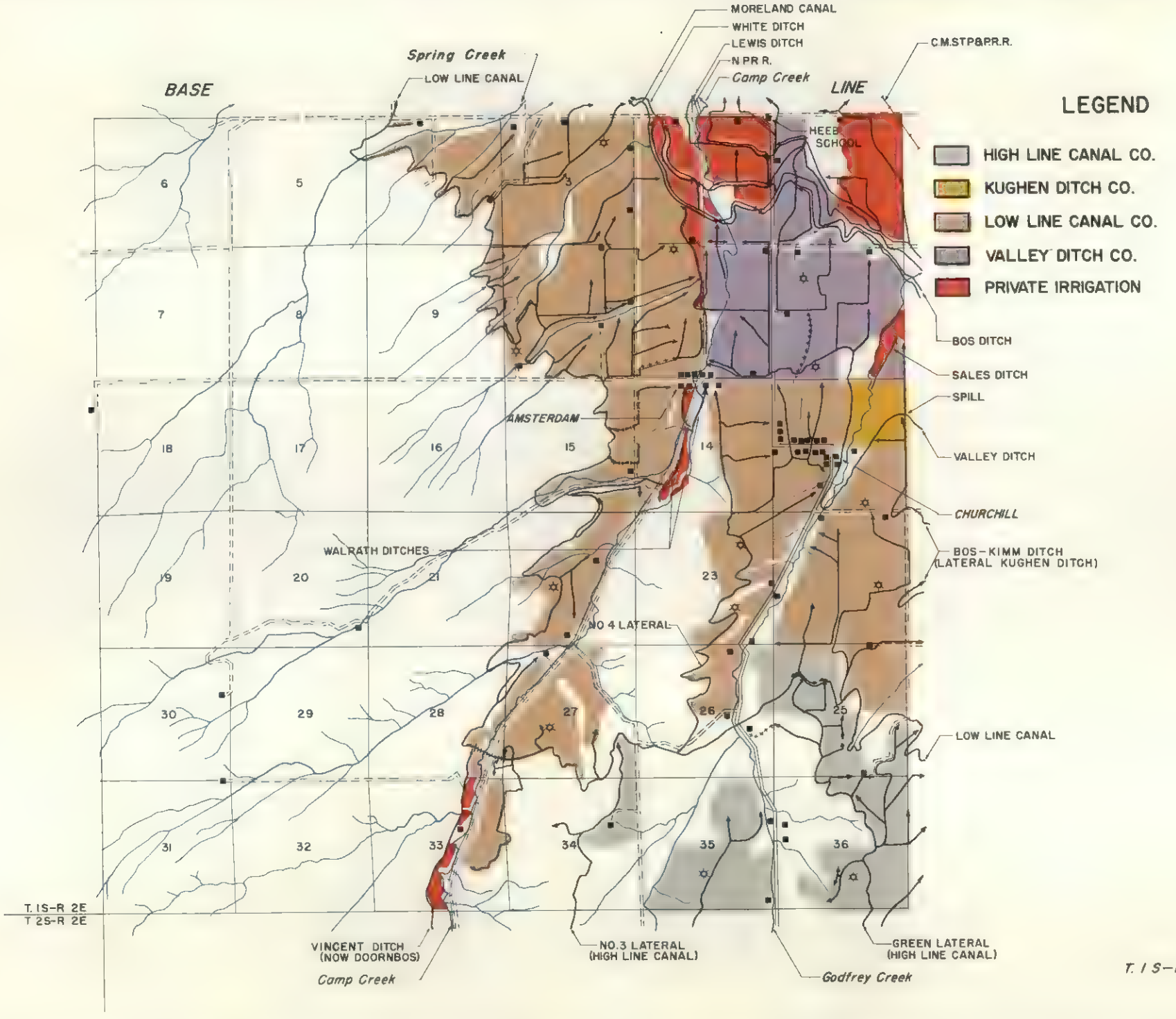
T. 5N–R. 5E

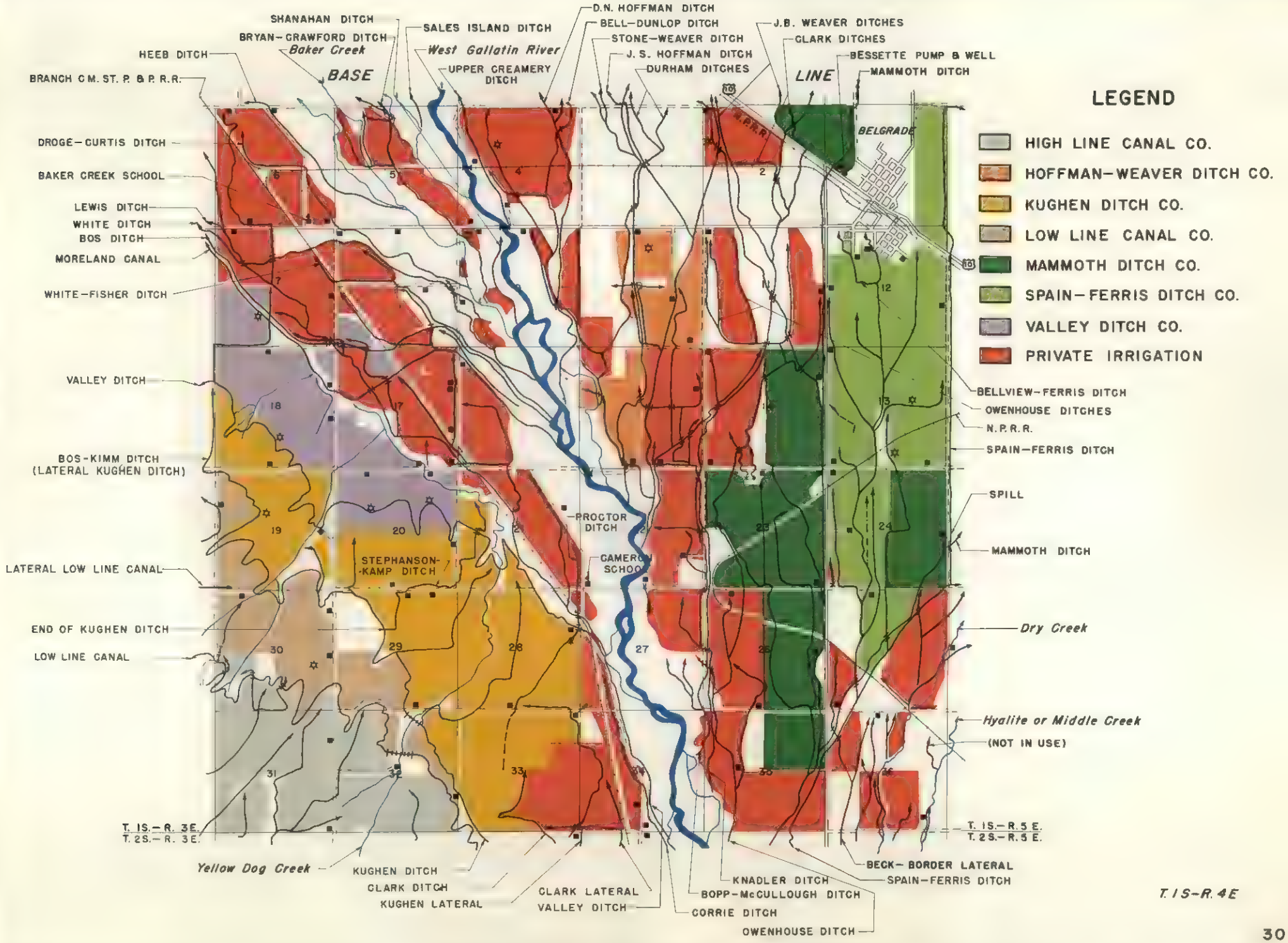

LEGEND
PRIVATE IRRIGATION
MEAGHER
COUNTY
West Meadow Creek
Middle Fork Meadow Creek
East Meadow or Camp Creek
HIGGINS DITCH
POTTER DITCH
HIGGINS RESERVOIR
Skunk or Bosh Creek
Lost Creek
OLD BLAIR DITCH
McMURDO DITCHES
TRACE OF DAVID WINTER DITCH
TRACE OF DITCH
OLD BLAIR DITCHES
18
17
16
15
14
13
19
20
21
22
23
24
30
29
28
27
26
25
31
32
33
34
35
36
COUNTY
PARK
T. 5 N.-R. 6 E.
T. 4 N. R. 6 E.
T. 5N.-R. 8E.
T. 4N.-R. 8E.
FIRST STANDARD PARALLEL NORTH

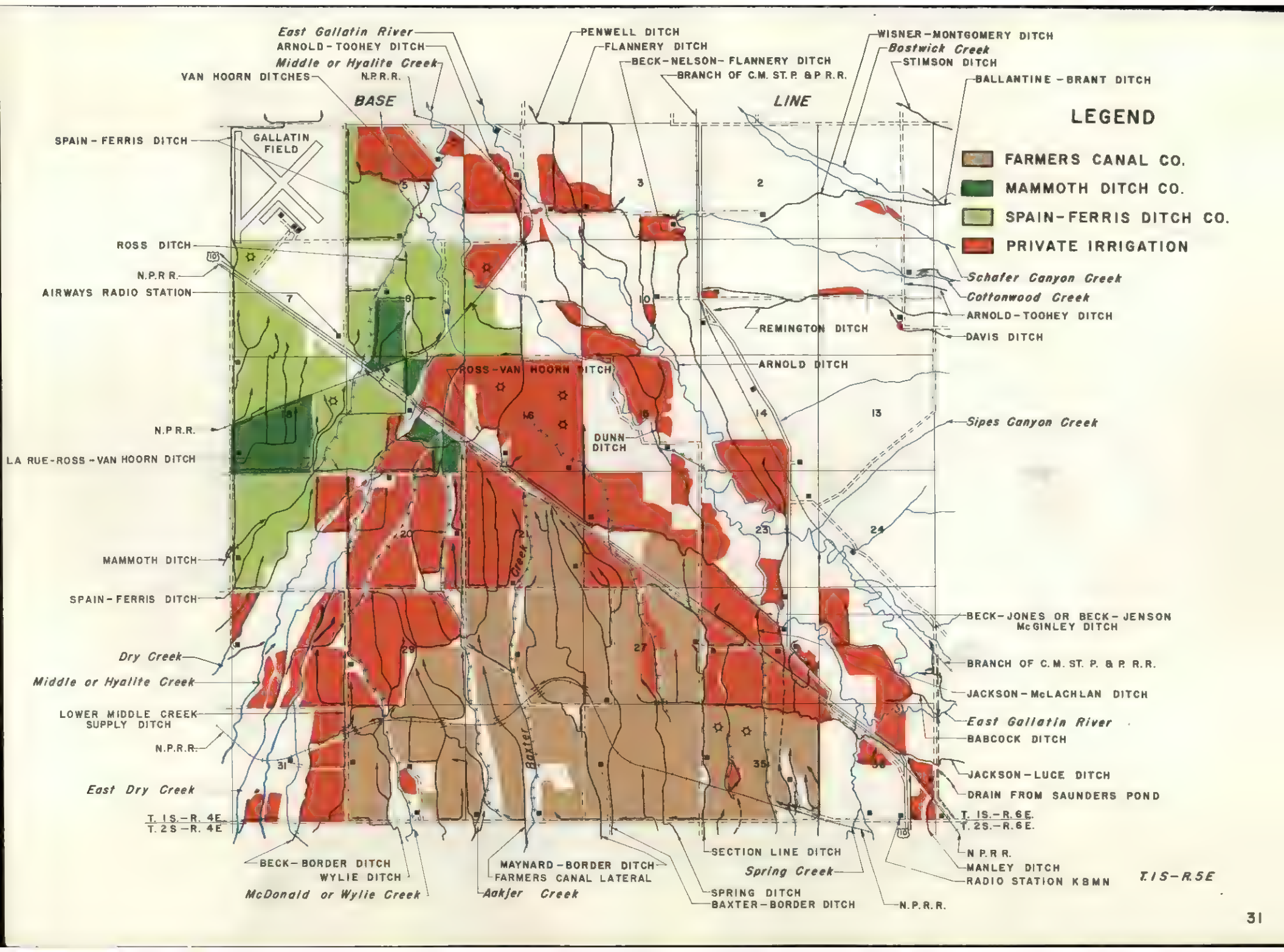
T. 5 N-R. 7 E

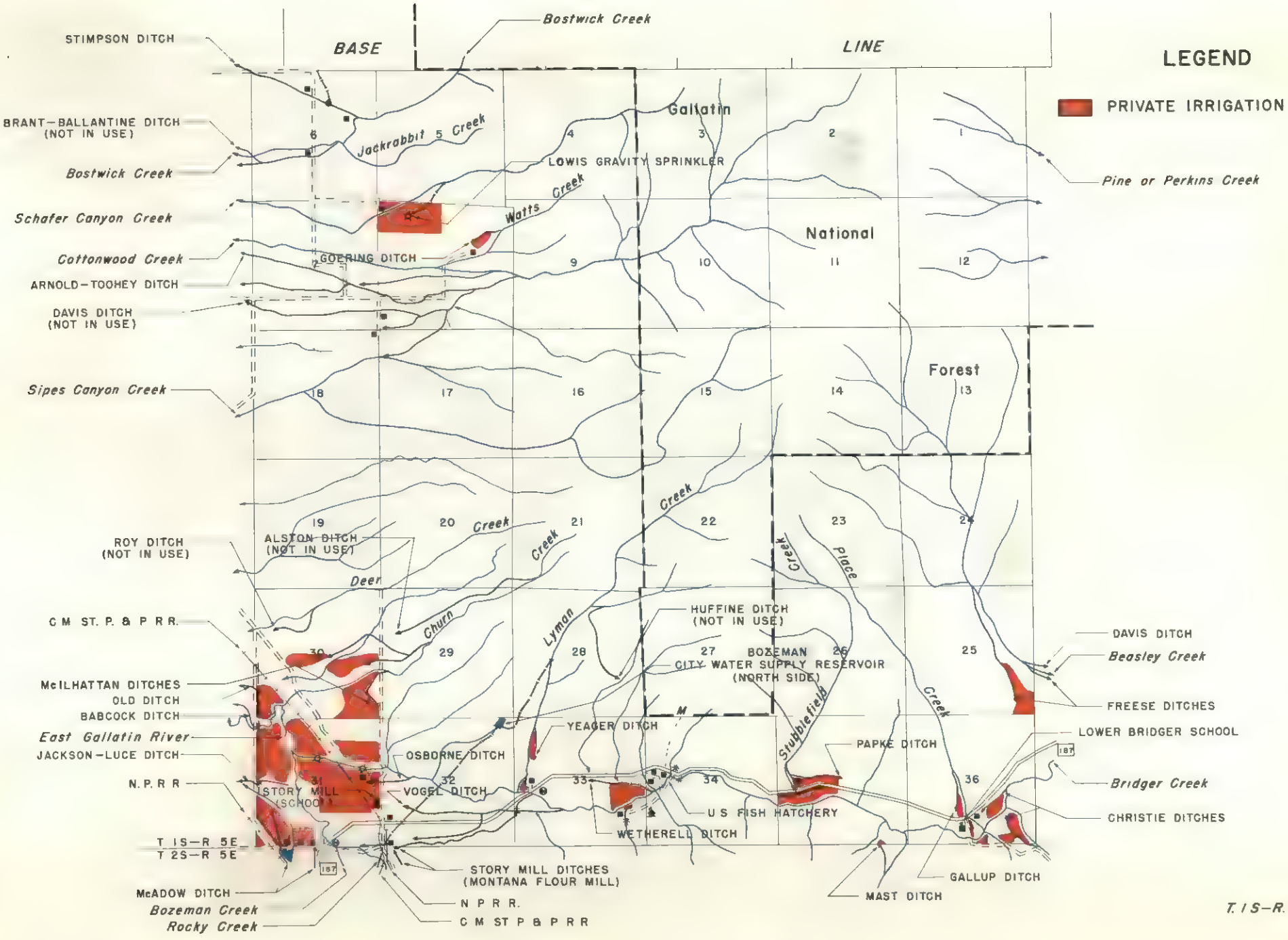

COOPER–MILLER–SALLEE DITCH
LANE–MILLER–COOPER DITCH
Willow Creek
BASE LINE
SAM LANE DITCH
NEW UPPER WILLOW CREEK DITCH (ROCKY DITCH)
UPPER WILLOW CREEK DITCH (COMPANY)
MERIDIAN
SALLEE DITCH
BUTTELMAN DITCHES
HARWOOD DITCHES NOS. 1&2
PRINCIPAL
MADISON
COUNTY
T.1S–R.1W.
T.2S.–R.1W.
T.1S–R.2E.
T.2S–R.2E.
LEGEND
WILLOW CR. WATER USERS ASS'N & PRIVATE IRRIGATION
PRIVATE IRRIGATION
T.1S–R.1E

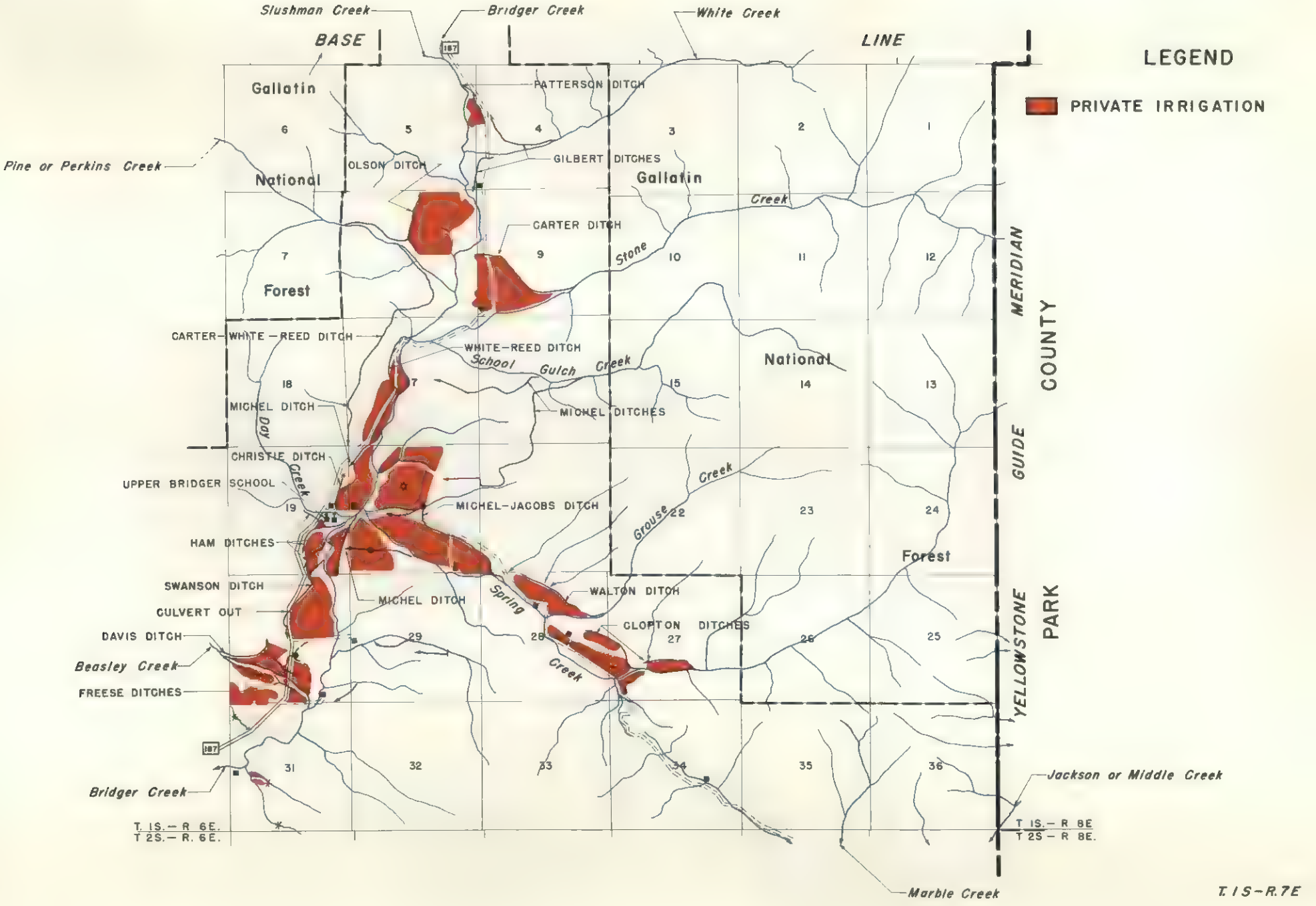

DARLINTON DITCHES
MADISON DIKE & DRAIN DITCH
Madison River
R 1E
R 2E
BASE
Bonnie Brook
Hot Springs Creek
END OF DELL DITCH
HUTCHINSON DITCH
LINE
CROWLEY DITCH
Creek
Springs
McDONNELL (DITCH)
TICE DITCH
UPPER MADISON (SCHOOL)
DELL DITCH
T 1S—R 1E
T 2S—R. 1E
RAMBOUILLET DITCH
Madison River
WATSON DITCH
SLOAN DITCH
HUTCHINSON DITCH
WILBUR SMITH LATERAL (HUTCHINSON DITCH)
LEGEND
PRIVATE IRRIGATION
T.1S-R.2E

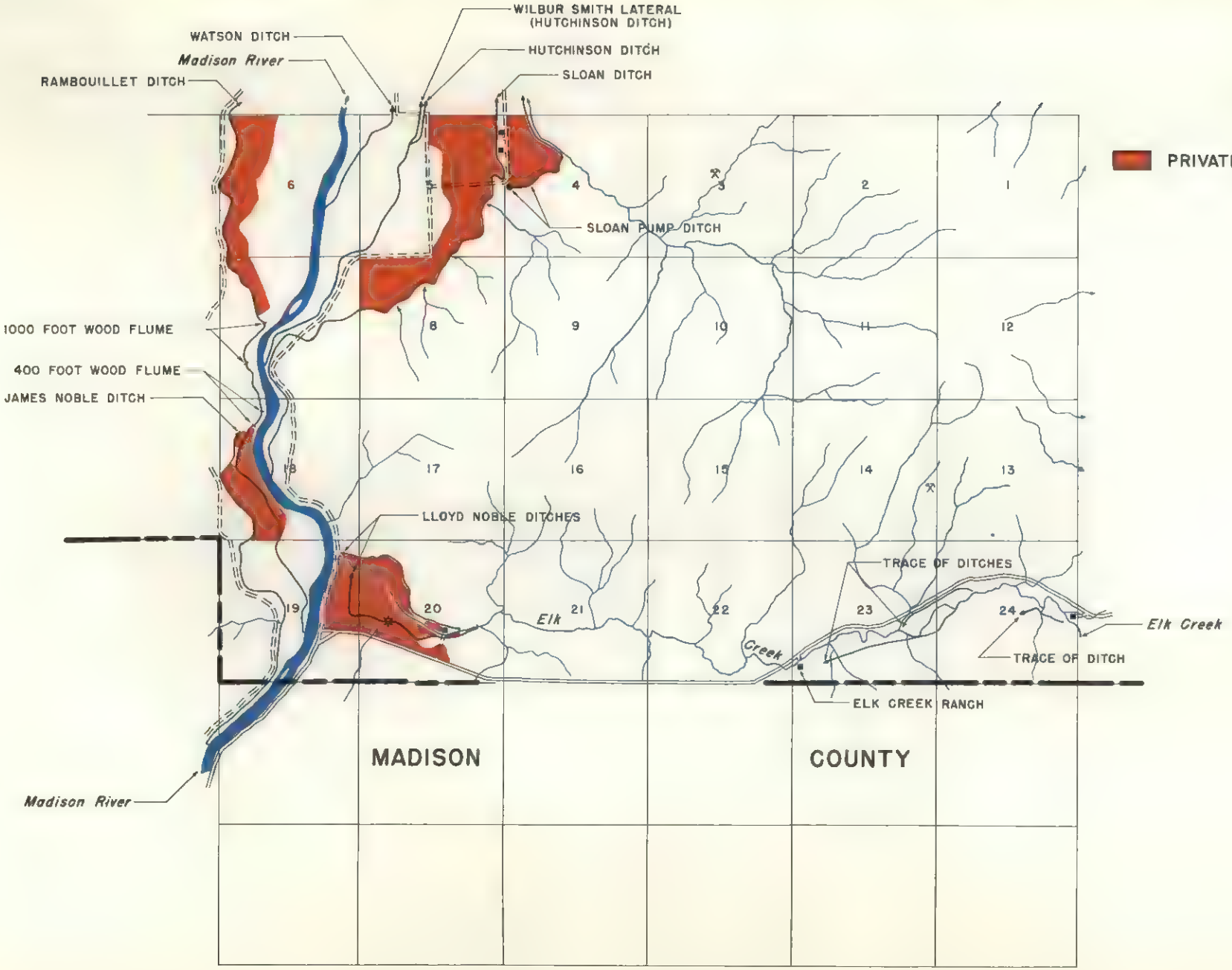

MORELAND CANAL
WHITE DITCH
LEWIS DITCH
N.P.R.R.
Camp Creek
C.M.ST.P&P.R.R.
Spring Creek
LOW LINE CANAL
BASE
LINE
HEEB SCHOOL
LEGEND
HIGH LINE CANAL CO.
KUGHEN DITCH CO.
LOW LINE CANAL CO.
VALLEY DITCH CO.
PRIVATE IRRIGATION
BOS DITCH
SALES DITCH
SPILL
VALLEY DITCH
AMSTERDAM
CHURCHILL
BOS-KIMM DITCH
(LATERAL KUGHEN DITCH)
WALRATH DITCHES
NO 4 LATERAL
LOW LINE CANAL
T. 1S-R 2E
T 2S-R 2E
VINCENT DITCH
(NOW DOORNBOS)
Camp Creek
NO.3 LATERAL
(HIGH LINE CANAL)
GREEN LATERAL
(HIGH LINE CANAL)
Godfrey Creek
T. 1 S-R. 3 E

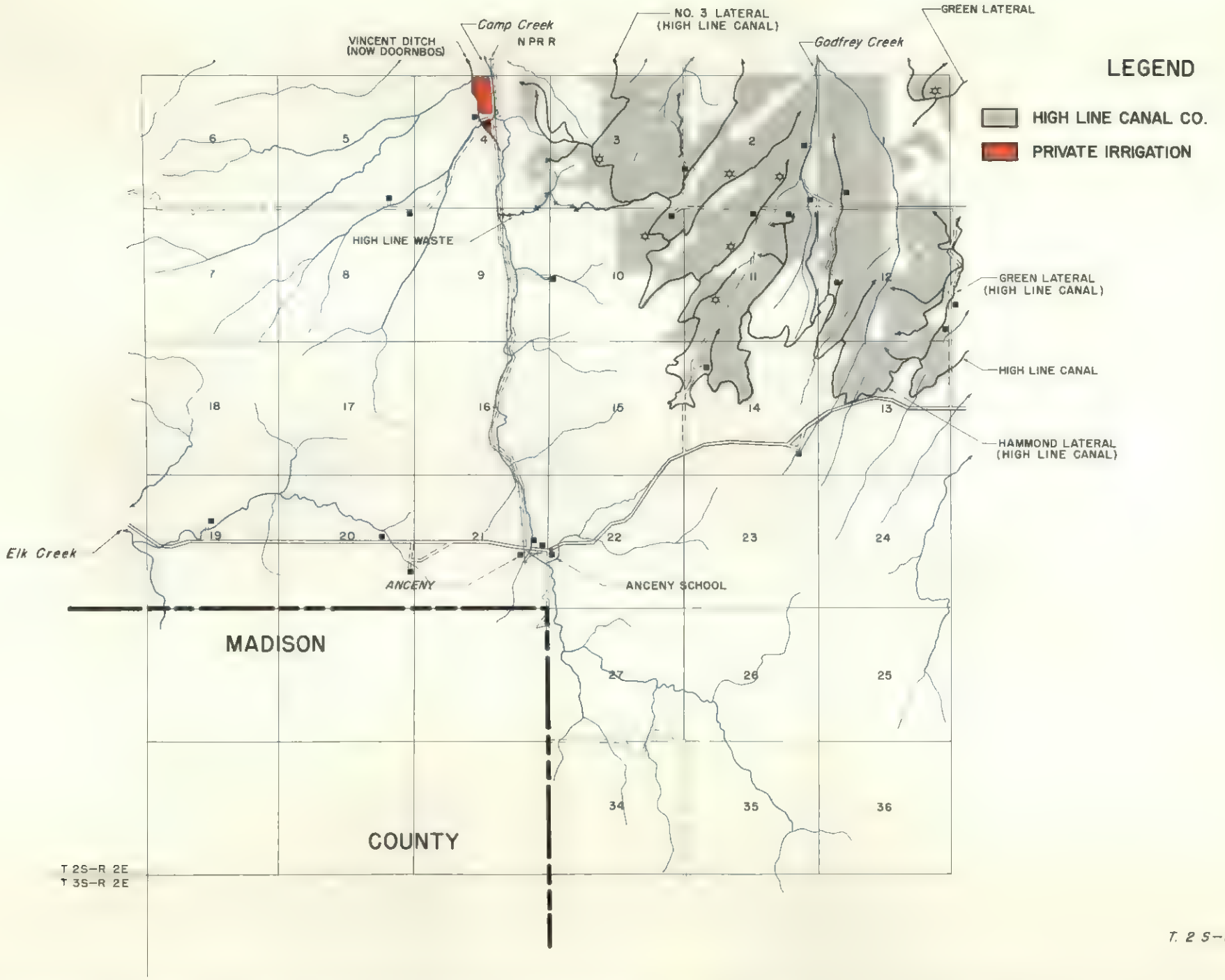

SHANAHAN DITCH
BRYAN-CRAWFORD DITCH
HEEB DITCH
BRANCH C.M. ST. P. & P. R.R.
Baker Creek
BASE
SALES ISLAND DITCH
West Gallatin River
UPPER CREAMERY DITCH
D.N. HOFFMAN DITCH
BELL-DUNLOP DITCH
STONE-WEAVER DITCH
J. S. HOFFMAN DITCH
DURHAM DITCHES
J.B. WEAVER DITCHES
CLARK DITCHES
BESSETTE PUMP & WELL
MAMMOTH DITCH
LINE
N.P.R.R.
BELGRADE
DROGE-CURTIS DITCH
BAKER CREEK SCHOOL
LEWIS DITCH
WHITE DITCH
BOS DITCH
MORELAND CANAL
WHITE-FISHER DITCH
VALLEY DITCH
BOS-KIMM DITCH
(LATERAL KUGHEN DITCH)
LATERAL LOW LINE CANAL
END OF KUGHEN DITCH
LOW LINE CANAL
STEPHANSON-KAMP DITCH
PROCTOR DITCH
CAMERON SCHOOL
BELLVIEW-FERRIS DITCH
OWENHOUSE DITCHES
N.P.R.R.
SPAIN-FERRIS DITCH
SPILL
MAMMOTH DITCH
Dry Creek
Hyalite or Middle Creek
(NOT IN USE)
T. 1S.-R. 3E.
T. 2S.-R. 3E.
T. 1S.-R. 5 E.
T. 2S.-R. 5 E.
Yellow Dog Creek
KUGHEN DITCH
CLARK DITCH
KUGHEN LATERAL
CLARK LATERAL
VALLEY DITCH
KNADLER DITCH
BOPP-McCULLOUGH DITCH
CORRIE DITCH
OWENHOUSE DITCH
BECK-BORDER LATERAL
SPAIN-FERRIS DITCH
T. 1S-R. 4E
LEGEND
HIGH LINE CANAL CO.
HOFFMAN-WEAVER DITCH CO.
KUGHEN DITCH CO.
LOW LINE CANAL CO.
MAMMOTH DITCH CO.
SPAIN-FERRIS DITCH CO.
VALLEY DITCH CO.
PRIVATE IRRIGATION

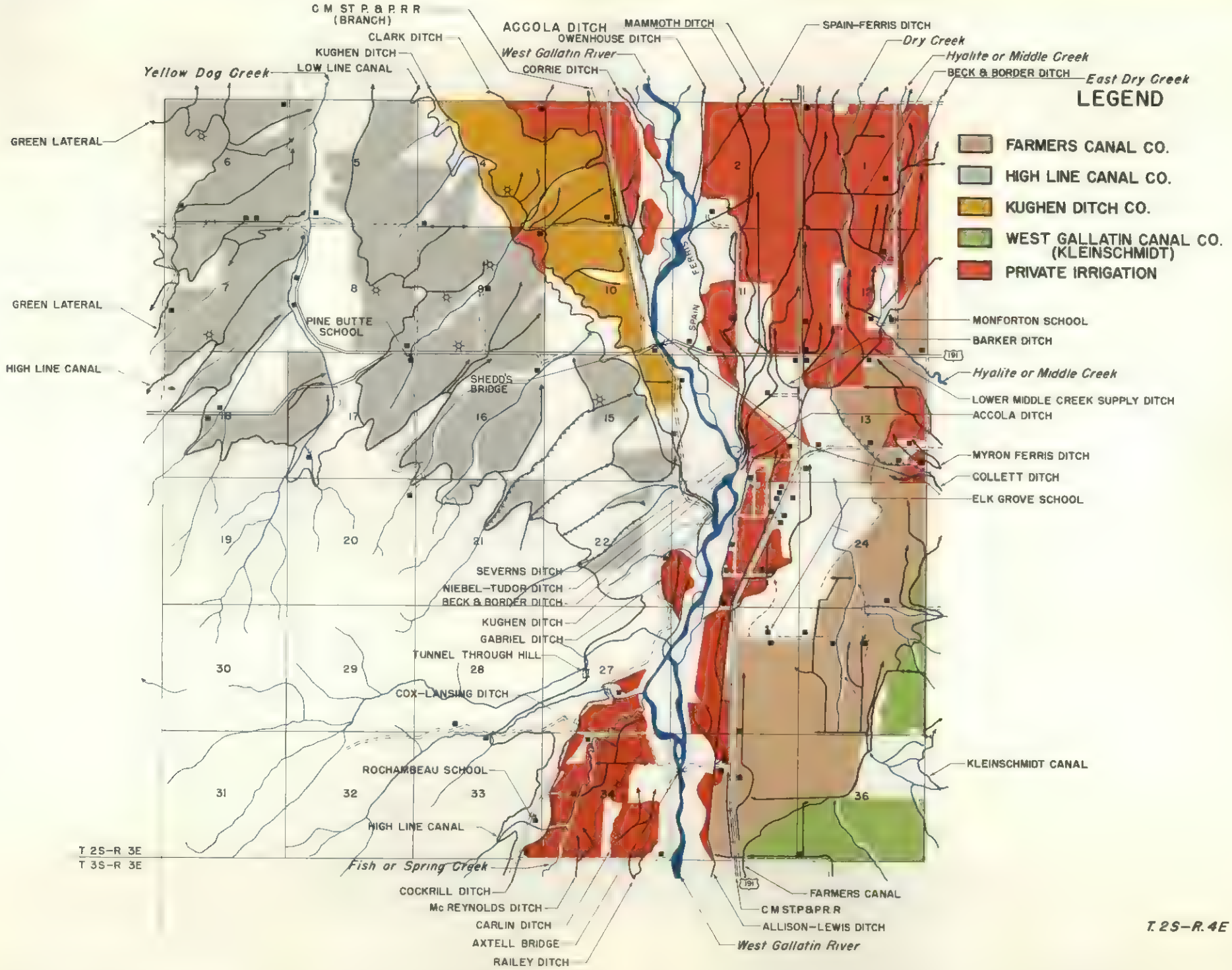

East Gallatin River
ARNOLD - TOOHEY DITCH
Middle or Hyalite Creek
VAN HOORN DITCHES
N.P.R.R.
PENWELL DITCH
FLANNERY DITCH
BECK - NELSON - FLANNERY DITCH
BRANCH OF C.M. ST. P. & P. R.R.
WISNER - MONTGOMERY DITCH
Bostwick Creek
STIMSON DITCH
BALLANTINE - BRANT DITCH
BASE
LINE
LEGEND
FARMERS CANAL CO.
MAMMOTH DITCH CO.
SPAIN - FERRIS DITCH CO.
PRIVATE IRRIGATION
SPAIN - FERRIS DITCH
GALLATIN FIELD
ROSS DITCH
N.P.R.R.
AIRWAYS RADIO STATION
Schafer Canyon Creek
Cottonwood Creek
ARNOLD - TOOHEY DITCH
REMINGTON DITCH
DAVIS DITCH
ROSS - VAN HOORN DITCH
ARNOLD DITCH
N.P.R.R.
LA RUE - ROSS - VAN HOORN DITCH
DUNN DITCH
Sipes Canyon Creek
MAMMOTH DITCH
SPAIN - FERRIS DITCH
Dry Creek
Middle or Hyalite Creek
LOWER MIDDLE CREEK SUPPLY DITCH
N.P.R.R.
East Dry Creek
Baxter Creek
BECK - JONES OR BECK - JENSON McGINLEY DITCH
BRANCH OF C.M. ST. P. & P. R.R.
JACKSON - McLACHLAN DITCH
East Gallatin River
BABCOCK DITCH
JACKSON - LUCE DITCH
DRAIN FROM SAUNDERS POND
T. 1S. - R. 4E.
T. 2S. - R. 4E.
T. 1S. - R. 6E.
T. 2S. - R. 6E.
BECK - BORDER DITCH
WYLIE DITCH
McDonald or Wylie Creek
MAYNARD - BORDER DITCH
FARMERS CANAL LATERAL
Aakjer Creek
SECTION LINE DITCH
Spring Creek
SPRING DITCH
BAXTER - BORDER DITCH
N.P.R.R.
N.P.R.R.
MANLEY DITCH
RADIO STATION KBMN
T. 1S. - R. 5E.

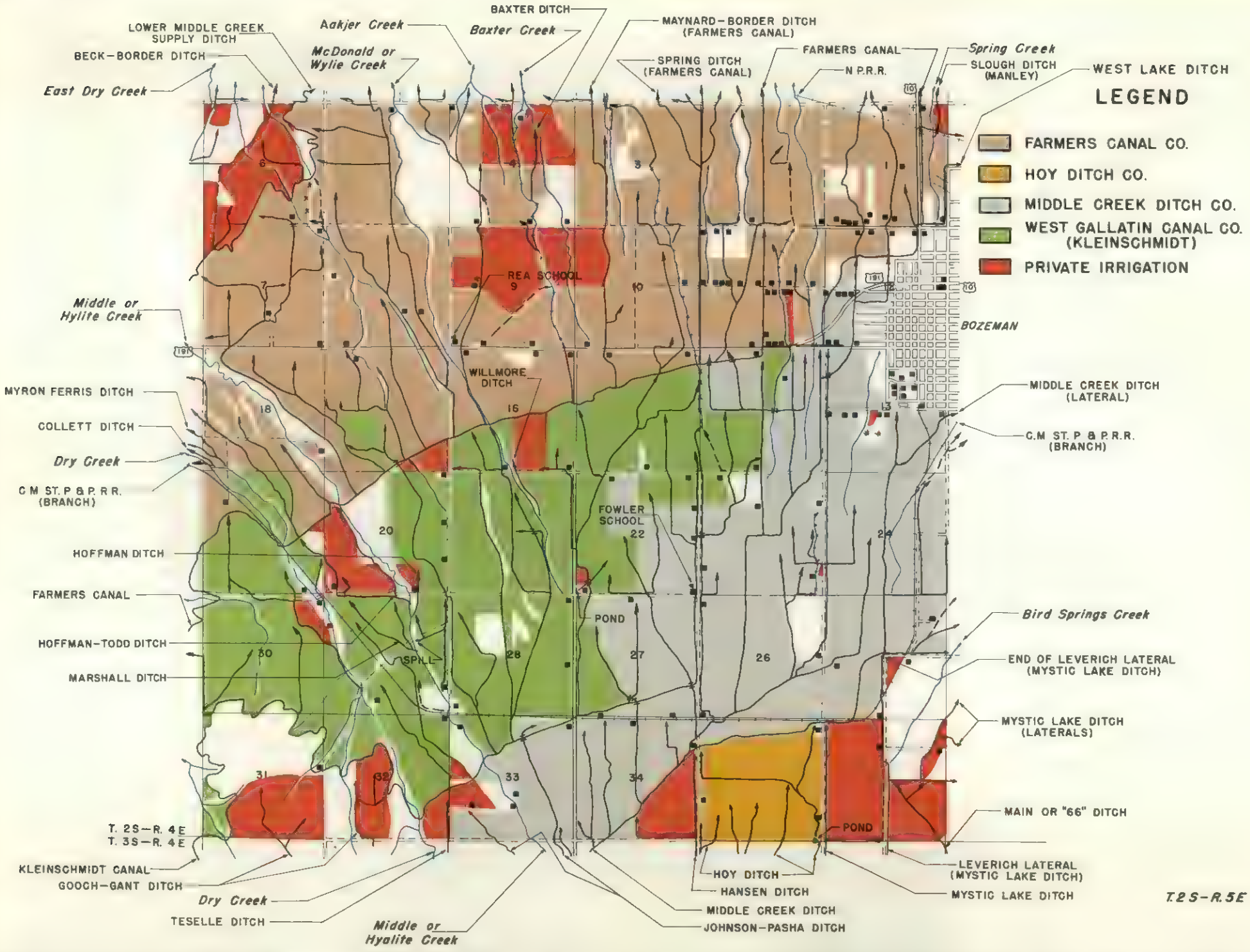

BASE
LINE
Bostwick Creek
STIMPSON DITCH
BRANT–BALLANTINE DITCH (NOT IN USE)
Bostwick Creek
Schafer Canyon Creek
Cottonwood Creek
ARNOLD–TOOHEY DITCH
DAVIS DITCH (NOT IN USE)
Sipes Canyon Creek
Jackrabbit 5 Creek
LOWIS GRAVITY SPRINKLER
Watts Creek
GOERING DITCH
Gallatin
National
Forest
Pine or Perkins Creek
ROY DITCH (NOT IN USE)
ALSTON DITCH (NOT IN USE)
Deer Creek
Churn Creek
Lyman Creek
Creek
Creek
Creek
Place
HUFFINE DITCH (NOT IN USE)
BOZEMAN CITY WATER SUPPLY RESERVOIR (NORTH SIDE)
C M ST. P. & P R R.
McILHATTAN DITCHES
OLD DITCH
BABCOCK DITCH
East Gallatin River
JACKSON–LUCE DITCH
N. P. R R
STORY MILL (SCHOOL)
OSBORNE DITCH
VOGEL DITCH
YEAGER DITCH
Stubblefield Creek
PAPKE DITCH
U S FISH HATCHERY
WETHERELL DITCH
DAVIS DITCH
Beasley Creek
FREESE DITCHES
LOWER BRIDGER SCHOOL
Bridger Creek
CHRISTIE DITCHES
GALLUP DITCH
MAST DITCH
T 1S–R 5E
T 2S–R 5E
McADOW DITCH
Bozeman Creek
Rocky Creek
STORY MILL DITCHES (MONTANA FLOUR MILL)
N P R R.
C M ST P & P R R
T. 1 S–R. 6 E
LEGEND
PRIVATE IRRIGATION

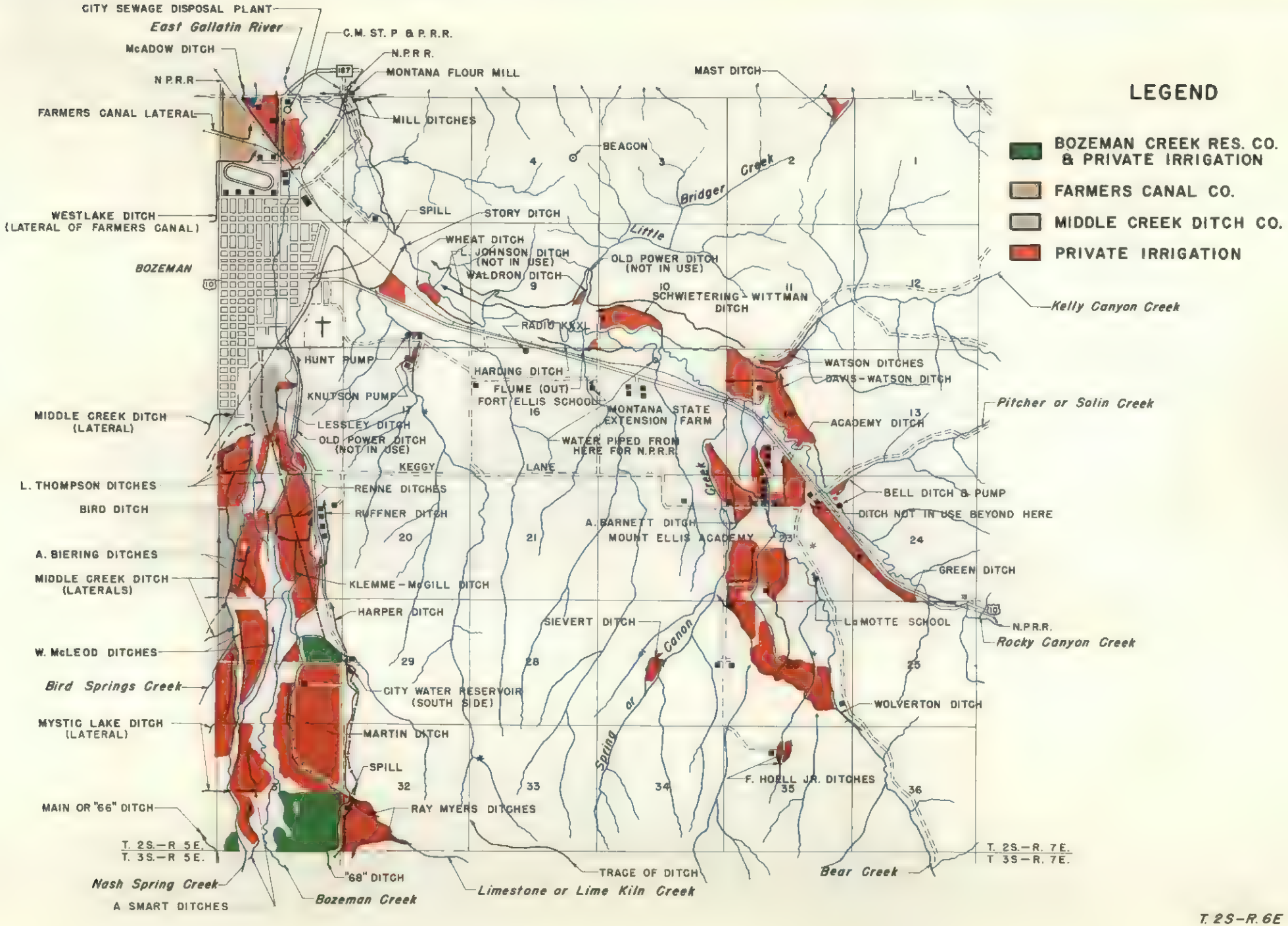

Slushman Creek
Bridger Creek
White Creek
BASE
LINE
LEGEND
PRIVATE IRRIGATION
Gallatin
National
Forest
Gallatin
National
Forest
PATTERSON DITCH
GILBERT DITCHES
OLSON DITCH
Pine or Perkins Creek
CARTER DITCH
Stone Creek
CARTER-WHITE-REED DITCH
WHITE-REED DITCH
School Gulch Creek
MICHEL DITCH
MICHEL DITCHES
Dry Creek
CHRISTIE DITCH
UPPER BRIDGER SCHOOL
MICHEL-JACOBS DITCH
Grouse Creek
HAM DITCHES
SWANSON DITCH
CULVERT OUT
MICHEL DITCH
Spring Creek
WALTON DITCH
GLOPTON DITCHES
DAVIS DITCH
Beasley Creek
FREESE DITCHES
Bridger Creek
Jackson or Middle Creek
Marble Creek
T. 1S.- R. 6E.
T. 2S.- R. 6E.
T. 1S.- R. 8E.
T. 2S.- R. 8E.
T. 1S-R.7E
MERIDIAN
COUNTY
GUIDE
YELLOWSTONE
PARK

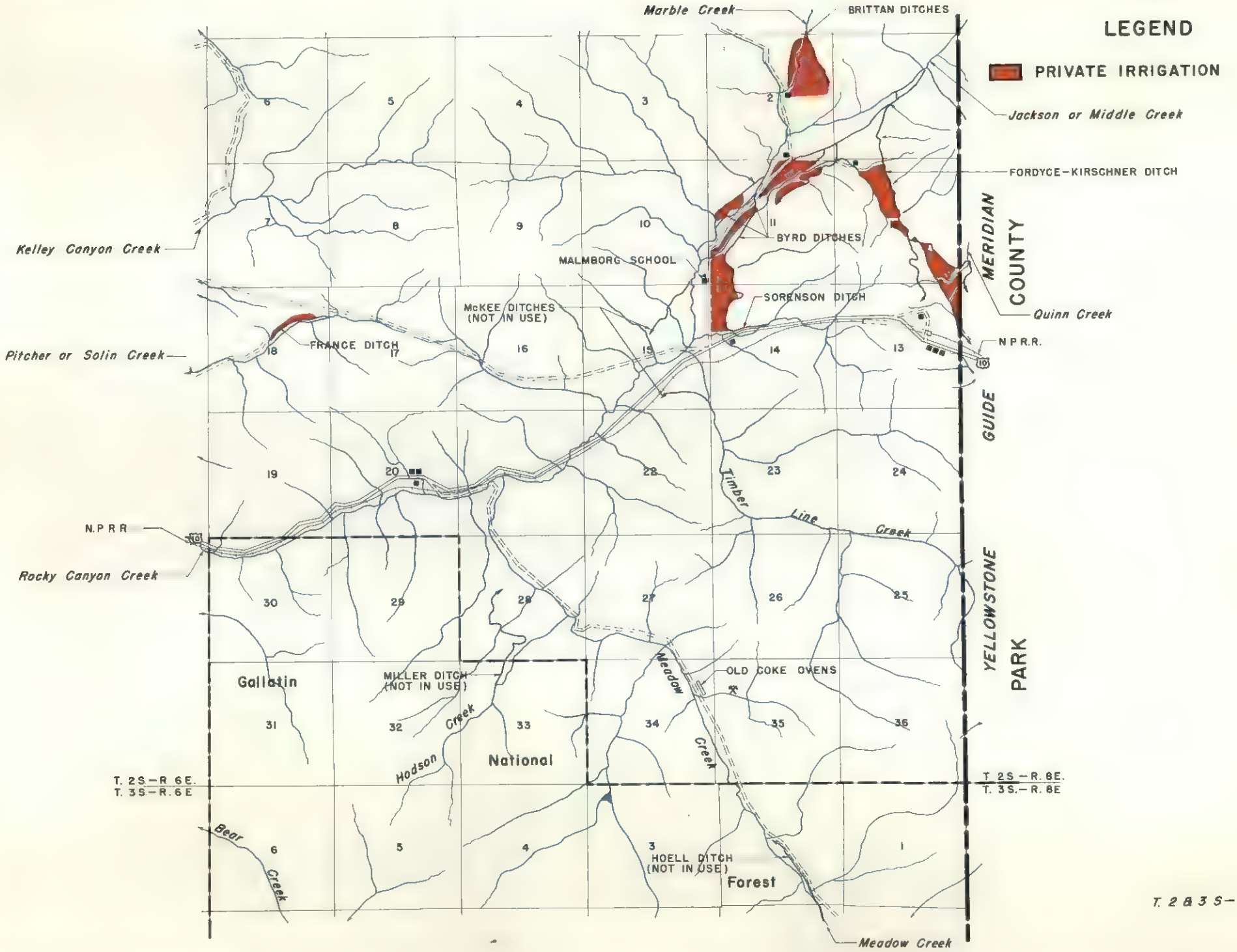

WILBUR SMITH LATERAL
(HUTCHINSON DITCH)
WATSON DITCH
HUTCHINSON DITCH
Madison River
SLOAN DITCH
RAMBOUILLET DITCH
SLOAN PUMP DITCH
1000 FOOT WOOD FLUME
400 FOOT WOOD FLUME
JAMES NOBLE DITCH
LLOYD NOBLE DITCHES
TRACE OF DITCHES
Elk Creek
TRACE OF DITCH
ELK CREEK RANCH
Madison River
MADISON
COUNTY
LEGEND
PRIVATE IRRIGATION
T.2 S–R.2E

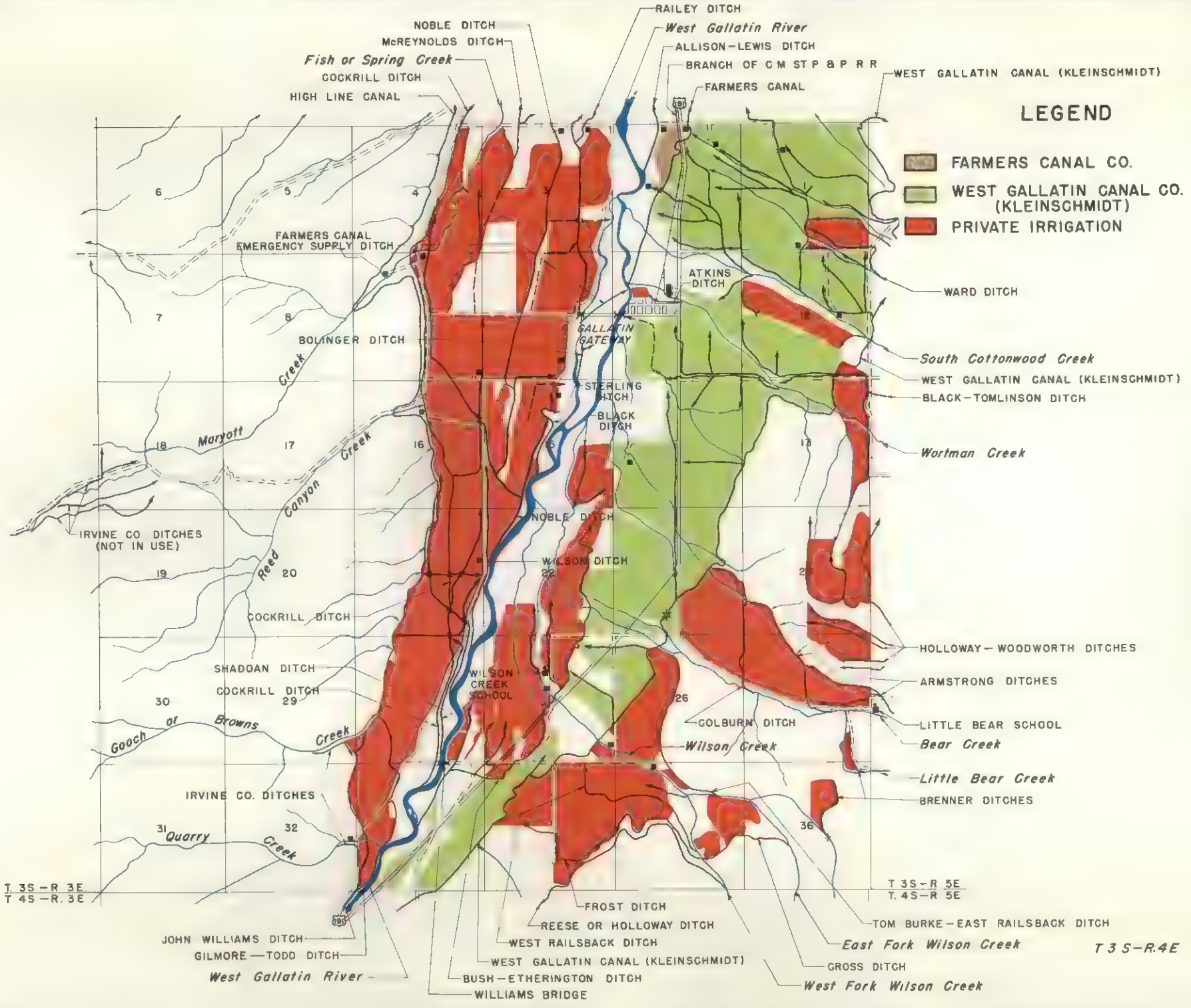

VINCENT DITCH
(NOW DOORNBOS)
Camp Creek
N P R R
NO. 3 LATERAL
(HIGH LINE CANAL)
Godfrey Creek
GREEN LATERAL
LEGEND
HIGH LINE CANAL CO.
PRIVATE IRRIGATION
HIGH LINE WASTE
GREEN LATERAL
(HIGH LINE CANAL)
HIGH LINE CANAL
HAMMOND LATERAL
(HIGH LINE CANAL)
Elk Creek
ANCENY
ANCENY SCHOOL
MADISON
COUNTY
T 2S–R 2E
T 3S–R 2E
T. 2 S–R 3 E

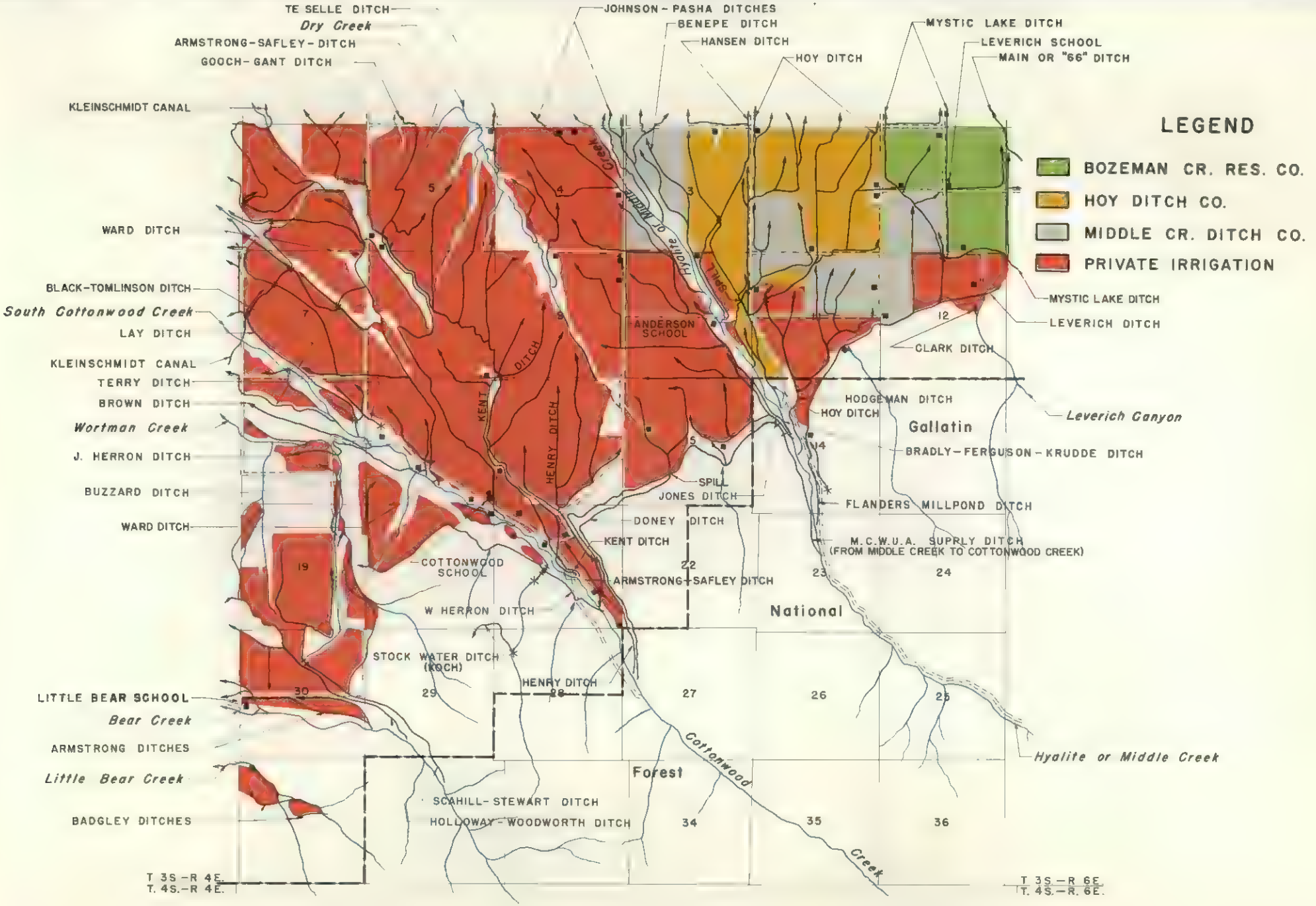

C M ST P & P R R (BRANCH)
ACCOLA DITCH
MAMMOTH DITCH
SPAIN–FERRIS DITCH
CLARK DITCH
OWENHOUSE DITCH
Dry Creek
KUGHEN DITCH
West Gallatin River
Hyalite or Middle Creek
Yellow Dog Creek
LOW LINE CANAL
CORRIE DITCH
BECK & BORDER DITCH
East Dry Creek
LEGEND
FARMERS CANAL CO.
HIGH LINE CANAL CO.
KUGHEN DITCH CO.
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
GREEN LATERAL
GREEN LATERAL
PINE BUTTE SCHOOL
SPAIN FERRIS
MONFORTON SCHOOL
BARKER DITCH
HIGH LINE CANAL
SHEDD'S BRIDGE
Hyalite or Middle Creek
LOWER MIDDLE CREEK SUPPLY DITCH
ACCOLA DITCH
MYRON FERRIS DITCH
COLLETT DITCH
ELK GROVE SCHOOL
SEVERNS DITCH
NIEBEL–TUDOR DITCH
BECK & BORDER DITCH
KUGHEN DITCH
GABRIEL DITCH
TUNNEL THROUGH HILL
COX–LANSING DITCH
KLEINSCHMIDT CANAL
ROCHAMBEAU SCHOOL
HIGH LINE CANAL
T 2S–R 3E
T 3S–R 3E
Fish or Spring Creek
COCKRILL DITCH
Mc REYNOLDS DITCH
CARLIN DITCH
AXTELL BRIDGE
RAILEY DITCH
FARMERS CANAL
C M ST P & P R R
ALLISON–LEWIS DITCH
West Gallatin River
T. 2S–R. 4E

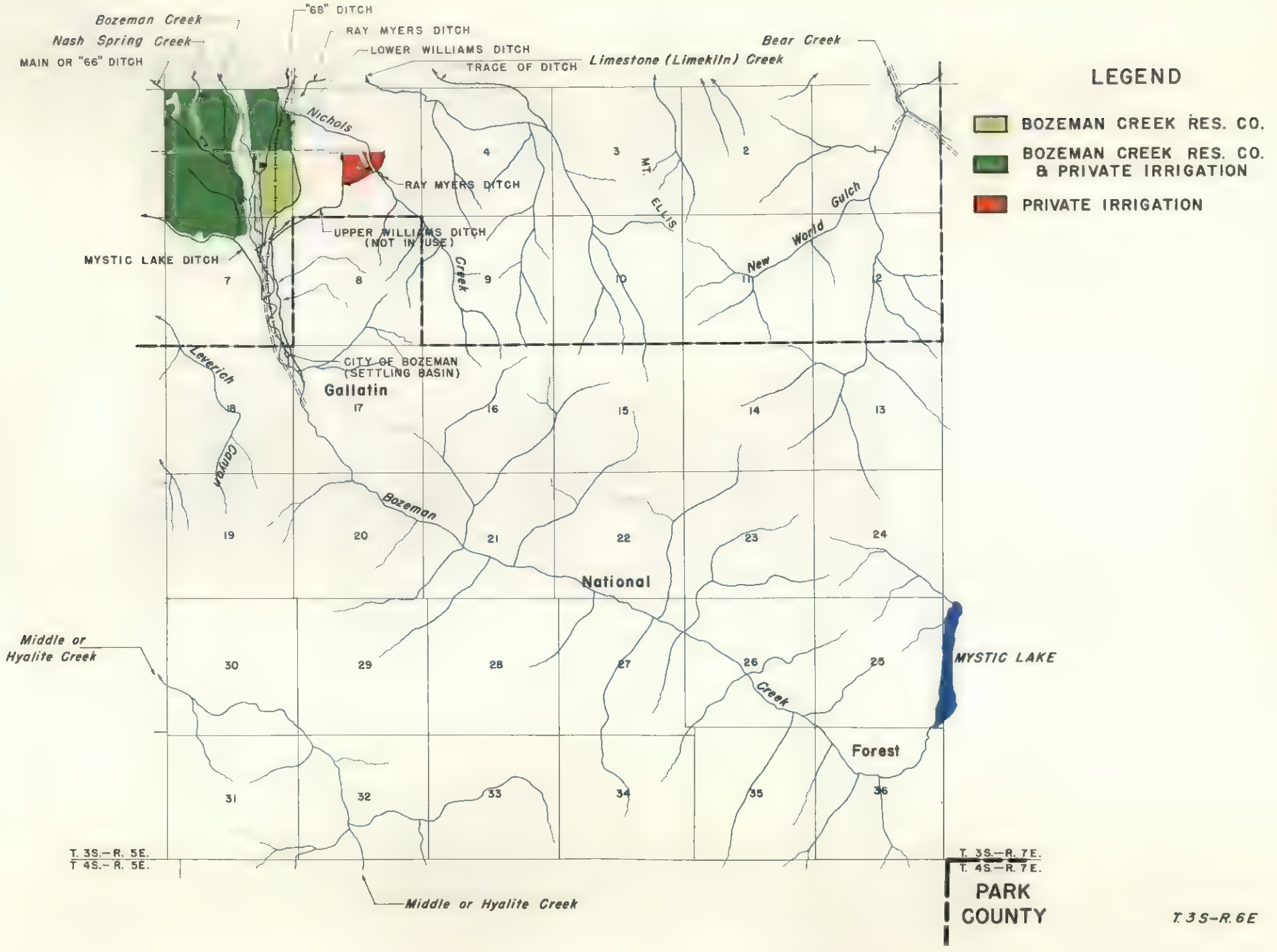

LOWER MIDDLE CREEK SUPPLY DITCH
BECK-BORDER DITCH
East Dry Creek
Aakjer Creek
McDonald or Wylie Creek
BAXTER DITCH
Baxter Creek
MAYNARD-BORDER DITCH (FARMERS CANAL)
SPRING DITCH (FARMERS CANAL)
FARMERS CANAL
N P.R.R.
Spring Creek
SLOUGH DITCH (MANLEY)
WEST LAKE DITCH
LEGEND
FARMERS CANAL CO.
HOY DITCH CO.
MIDDLE CREEK DITCH CO.
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
REA SCHOOL
Middle or Hylite Creek
BOZEMAN
WILLMORE DITCH
MYRON FERRIS DITCH
COLLETT DITCH
Dry Creek
C M ST. P & P. R R. (BRANCH)
MIDDLE CREEK DITCH (LATERAL)
C.M ST. P & P.R.R. (BRANCH)
FOWLER SCHOOL
HOFFMAN DITCH
FARMERS CANAL
HOFFMAN-TODD DITCH
MARSHALL DITCH
POND
SPILL
Bird Springs Creek
END OF LEVERICH LATERAL (MYSTIC LAKE DITCH)
MYSTIC LAKE DITCH (LATERALS)
MAIN OR "66" DITCH
POND
T. 2S-R. 4E
T. 3S-R. 4E
KLEINSCHMIDT CANAL
GOOCH-GANT DITCH
Dry Creek
TESELLE DITCH
Middle or Hyalite Creek
HOY DITCH
HANSEN DITCH
MIDDLE CREEK DITCH
JOHNSON-PASHA DITCH
LEVERICH LATERAL (MYSTIC LAKE DITCH)
MYSTIC LAKE DITCH
T.2S-R.5E

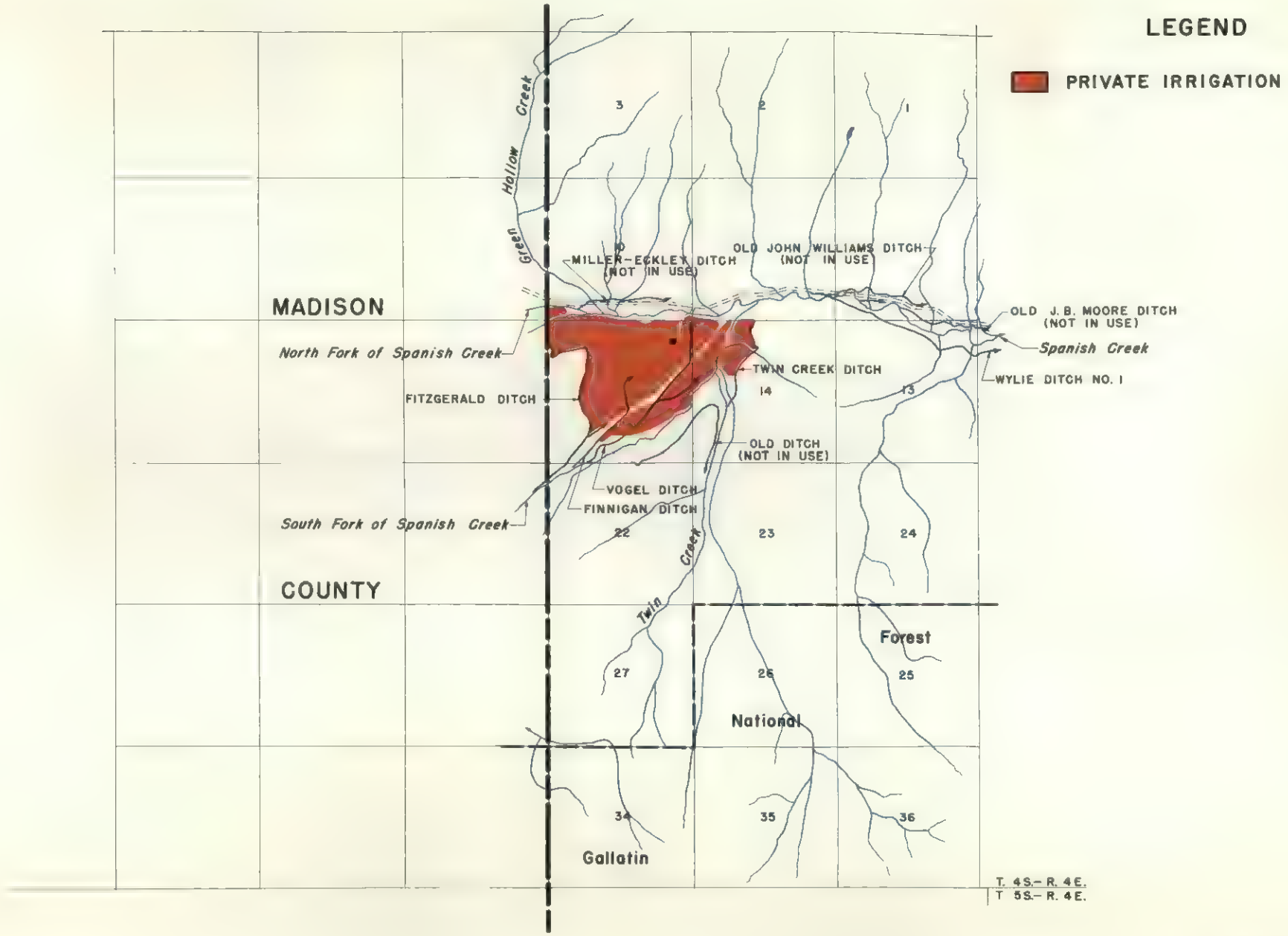

CITY SEWAGE DISPOSAL PLANT
East Gallatin River
C.M. ST. P & P. R.R.
N.P.R.R.
McADOW DITCH
N.P.R.R.
MONTANA FLOUR MILL
MAST DITCH
FARMERS CANAL LATERAL
MILL DITCHES
BEACON
Bridger
Creek
WESTLAKE DITCH
(LATERAL OF FARMERS CANAL)
SPILL
STORY DITCH
Little
WHEAT DITCH
L. JOHNSON DITCH
(NOT IN USE)
OLD POWER DITCH
(NOT IN USE)
WALDRON DITCH
BOZEMAN
SCHWIETERING - WITTMAN
DITCH
Kelly Canyon Creek
RADIO KXXL
HUNT PUMP
HARDING DITCH
WATSON DITCHES
DAVIS - WATSON DITCH
FLUME (OUT)
FORT ELLIS SCHOOL
KNUTSON PUMP
MONTANA STATE
EXTENSION FARM
Pitcher or Solin Creek
MIDDLE CREEK DITCH
(LATERAL)
LESSLEY DITCH
ACADEMY DITCH
OLD POWER DITCH
(NOT IN USE)
WATER PIPED FROM
HERE FOR N.P.R.R.
KEGGY
LANE
L. THOMPSON DITCHES
RENNE DITCHES
Creek
BELL DITCH & PUMP
BIRD DITCH
RUFFNER DITCH
DITCH NOT IN USE BEYOND HERE
A. BARNETT DITCH
MOUNT ELLIS ACADEMY
A. BIERING DITCHES
GREEN DITCH
MIDDLE CREEK DITCH
(LATERALS)
KLEMME - McGILL DITCH
HARPER DITCH
SIEVERT DITCH
LaMOTTE SCHOOL
N.P.R.R.
Rocky Canyon Creek
W. McLEOD DITCHES
Canon
Bird Springs Creek
CITY WATER RESERVOIR
(SOUTH SIDE)
WOLVERTON DITCH
MYSTIC LAKE DITCH
(LATERAL)
MARTIN DITCH
Spring or
SPILL
F. HOELL JR. DITCHES
MAIN OR "66" DITCH
RAY MYERS DITCHES
T. 2S.—R. 5E.
T. 3S.—R. 5E.
T. 2S.—R. 7E.
T. 3S—R. 7E.
Nash Spring Creek
"68" DITCH
TRACE OF DITCH
Bear Creek
A SMART DITCHES
Bozeman Creek
Limestone or Lime Kiln Creek
LEGEND
BOZEMAN CREEK RES. CO.
& PRIVATE IRRIGATION
FARMERS CANAL CO.
MIDDLE CREEK DITCH CO.
PRIVATE IRRIGATION
T. 2S—R. 6E

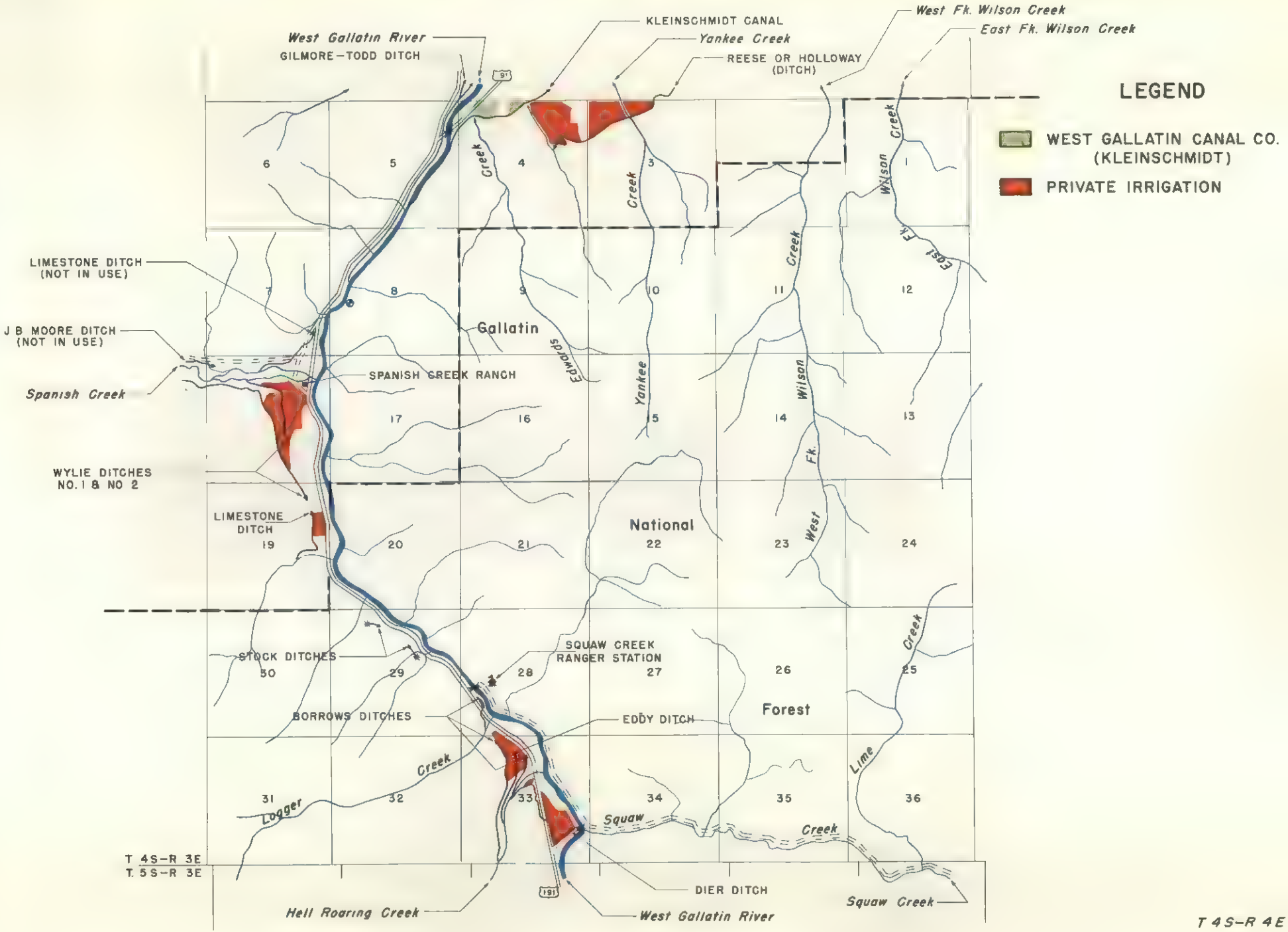

LEGEND
PRIVATE IRRIGATION
Marble Creek
BRITTAN DITCHES
Jackson or Middle Creek
FORDYCE-KIRSCHNER DITCH
BYRD DITCHES
MALMBORG SCHOOL
SORENSON DITCH
McKEE DITCHES (NOT IN USE)
Quinn Creek
N P R.R.
Kelley Canyon Creek
Pitcher or Solin Creek
FRANCE DITCH
MERIDIAN
COUNTY
GUIDE
YELLOWSTONE
PARK
Timber Line Creek
N.P.R.R.
Rocky Canyon Creek
Gallatin
National
Forest
MILLER DITCH (NOT IN USE)
OLD COKE OVENS
Meadow Creek
Hodson Creek
Bear Creek
HOELL DITCH (NOT IN USE)
T. 2S - R. 6E.
T. 3S - R. 6E
T. 2S - R. 8E.
T. 3S. - R. 8E
T. 2 & 3 S - R. 7 E

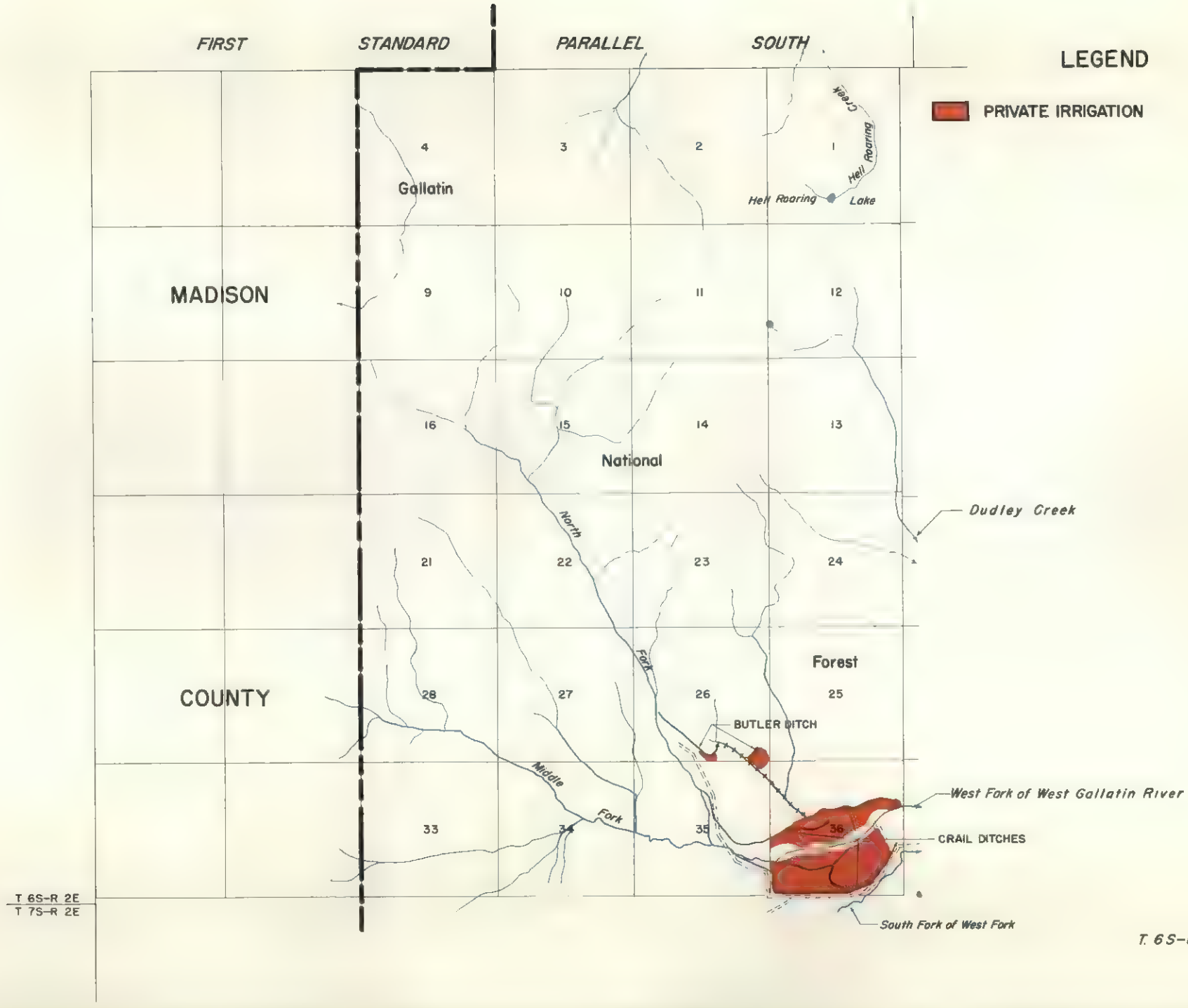

LEGEND
FARMERS CANAL CO.
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
RAILEY DITCH
West Gallatin River
ALLISON-LEWIS DITCH
BRANCH OF C M ST P & P R R
FARMERS CANAL
WEST GALLATIN CANAL (KLEINSCHMIDT)
NOBLE DITCH
McREYNOLDS DITCH
Fish or Spring Creek
COCKRILL DITCH
HIGH LINE CANAL
FARMERS CANAL EMERGENCY SUPPLY DITCH
ATKINS DITCH
WARD DITCH
BOLINGER DITCH
GALLATIN GATEWAY
South Cottonwood Creek
WEST GALLATIN CANAL (KLEINSCHMIDT)
STERLING DITCH
BLACK-TOMLINSON DITCH
BLACK DITCH
Wortman Creek
Maryott Creek
Canyon Creek
Reed
NOBLE DITCH
IRVINE CO DITCHES (NOT IN USE)
WILSON DITCH
COCKRILL DITCH
HOLLOWAY-WOODWORTH DITCHES
SHADOAN DITCH
COCKRILL DITCH
WILSON CREEK SCHOOL
ARMSTRONG DITCHES
LITTLE BEAR SCHOOL
Gooch or Browns Creek
COLBURN DITCH
Bear Creek
Wilson Creek
Little Bear Creek
IRVINE CO. DITCHES
BRENNER DITCHES
Quarry Creek
T 3S-R 3E
T 4S-R. 3E
T 3S-R 5E
T. 4S-R 5E
FROST DITCH
REESE OR HOLLOWAY DITCH
TOM BURKE-EAST RAILSBACK DITCH
JOHN WILLIAMS DITCH
WEST RAILSBACK DITCH
East Fork Wilson Creek
GILMORE-TODD DITCH
WEST GALLATIN CANAL (KLEINSCHMIDT)
T 3S-R.4E
West Gallatin River
BUSH-ETHERINGTON DITCH
GROSS DITCH
WILLIAMS BRIDGE
West Fork Wilson Creek

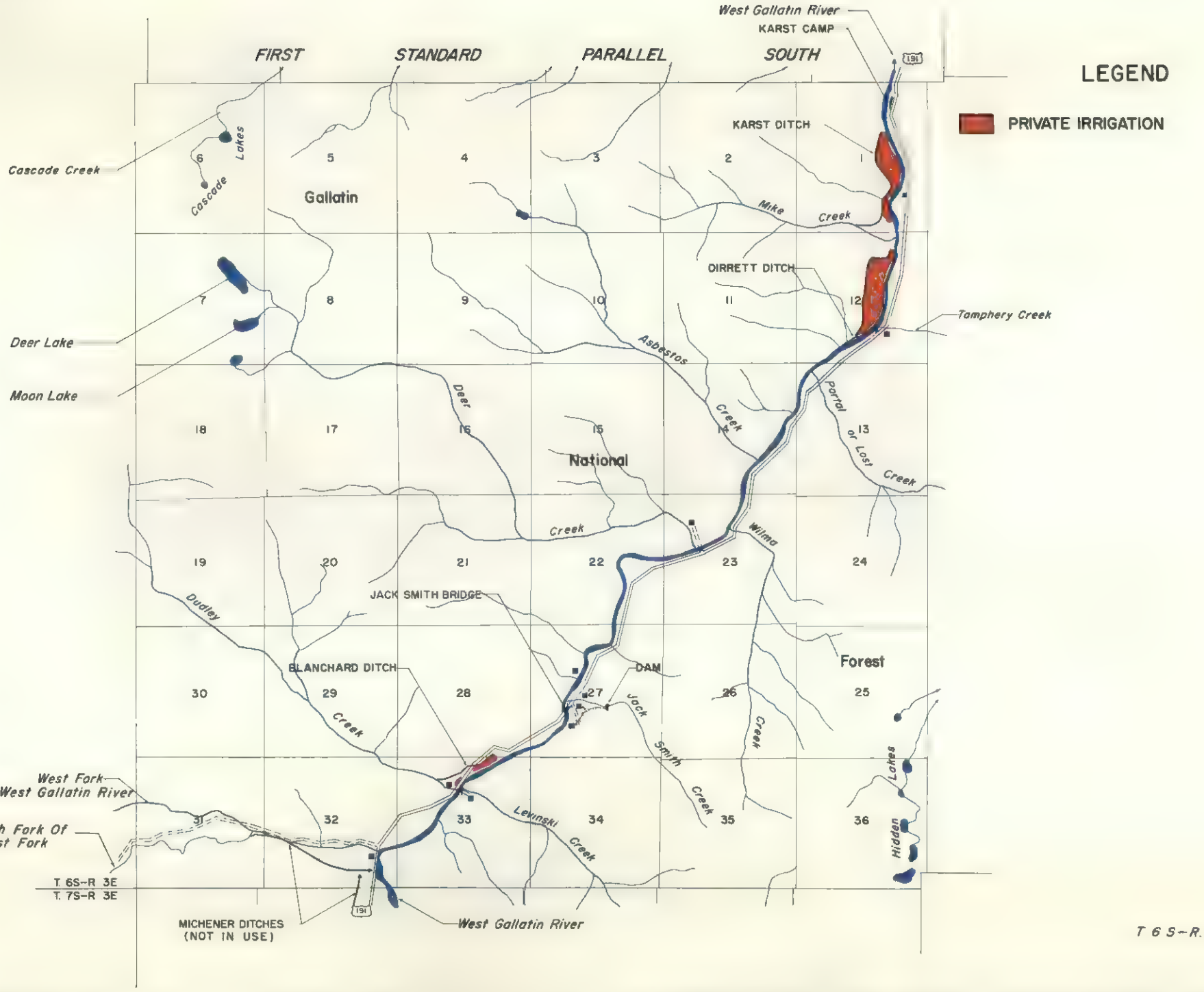

TE SELLE DITCH
Dry Creek
ARMSTRONG-SAFLEY-DITCH
GOOCH-GANT DITCH
JOHNSON-PASHA DITCHES
BENEPE DITCH
HANSEN DITCH
HOY DITCH
MYSTIC LAKE DITCH
LEVERICH SCHOOL
MAIN OR "66" DITCH
KLEINSCHMIDT CANAL
WARD DITCH
BLACK-TOMLINSON DITCH
South Cottonwood Creek
LAY DITCH
KLEINSCHMIDT CANAL
TERRY DITCH
BROWN DITCH
Wortman Creek
J. HERRON DITCH
BUZZARD DITCH
WARD DITCH
LITTLE BEAR SCHOOL
Bear Creek
ARMSTRONG DITCHES
Little Bear Creek
BADGLEY DITCHES
T 3S-R 4E.
T. 4S.-R 4E.
LEGEND
BOZEMAN CR. RES. CO.
HOY DITCH CO.
MIDDLE CR. DITCH CO.
PRIVATE IRRIGATION
MYSTIC LAKE DITCH
LEVERICH DITCH
CLARK DITCH
HODGEMAN DITCH
HOY DITCH
Leverich Canyon
Gallatin
BRADLY-FERGUSON-KRUDDE DITCH
FLANDERS MILLPOND DITCH
M.C.W.U.A. SUPPLY DITCH
(FROM MIDDLE CREEK TO COTTONWOOD CREEK)
ANDERSON SCHOOL
KENT DITCH
HENRY DITCH
SPILL
JONES DITCH
DONEY DITCH
KENT DITCH
COTTONWOOD SCHOOL
ARMSTRONG-SAFLEY DITCH
W HERRON DITCH
National
STOCK WATER DITCH
(KOCH)
HENRY DITCH
SCAHILL-STEWART DITCH
HOLLOWAY-WOODWORTH DITCH
Forest
Cottonwood Creek
Hyalite or Middle Creek
T 3S-R 6E.
T. 4S.-R. 6E.
T. 3S-R 5E

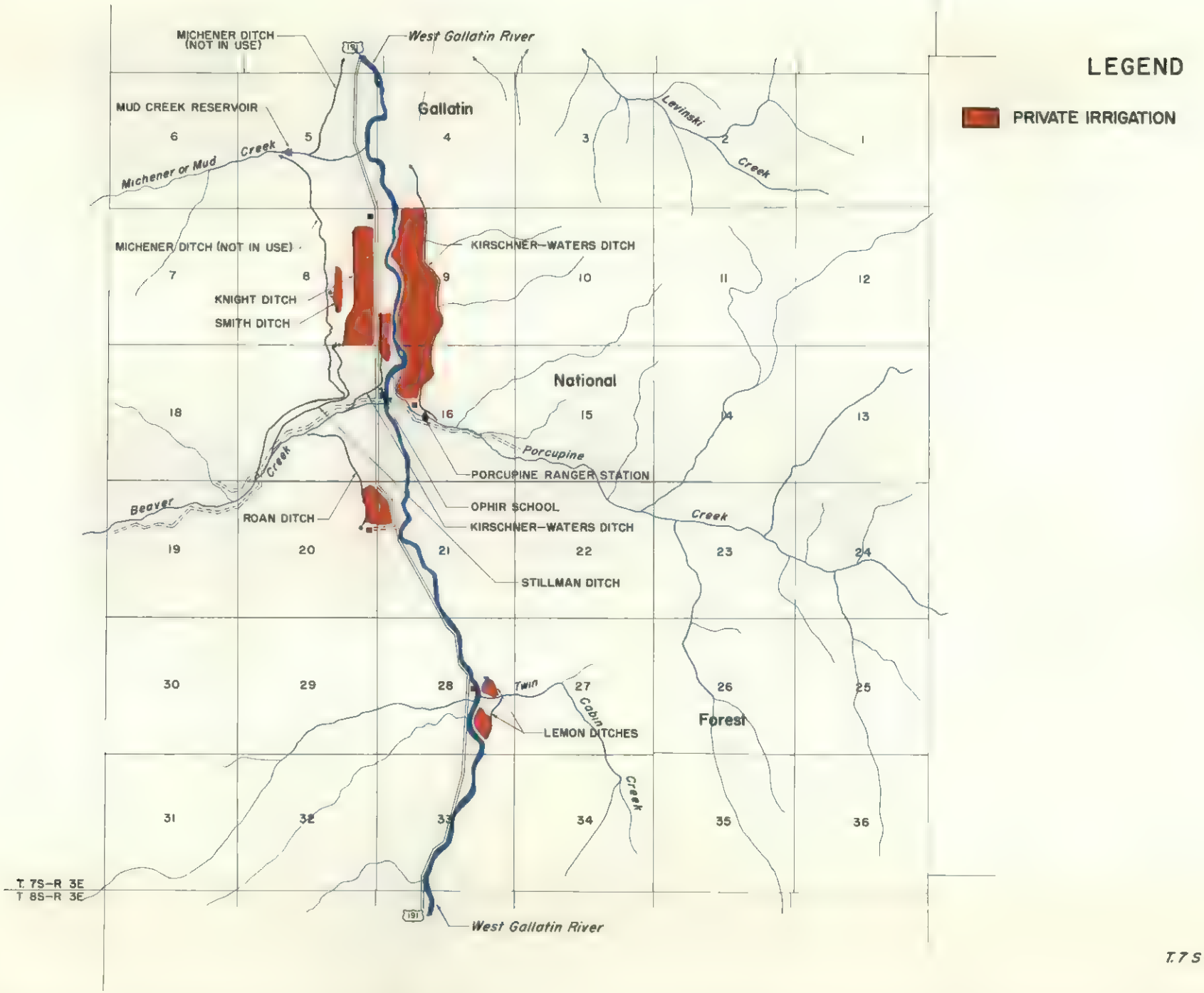

Bozeman Creek
Nash Spring Creek
MAIN OR "66" DITCH
"66" DITCH
RAY MYERS DITCH
LOWER WILLIAMS DITCH
TRACE OF DITCH
Limestone (Limekiln) Creek
Bear Creek
Nichols
RAY MYERS DITCH
UPPER WILLIAMS DITCH
(NOT IN USE)
MYSTIC LAKE DITCH
Mt. Ellis
Gulch
New World
Creek
Leverich
Canyon
CITY OF BOZEMAN
(SETTLING BASIN)
Gallatin
Bozeman
National
Forest
MYSTIC LAKE
Middle or Hyalite Creek
Middle or Hyalite Creek
T. 3S.—R. 5E.
T 4S.—R. 5E.
T. 3S.—R. 7E.
T. 4S.—R. 7E.
PARK COUNTY
T 3S-R. 6E
LEGEND
BOZEMAN CREEK RES. CO.
BOZEMAN CREEK RES. CO. & PRIVATE IRRIGATION
PRIVATE IRRIGATION

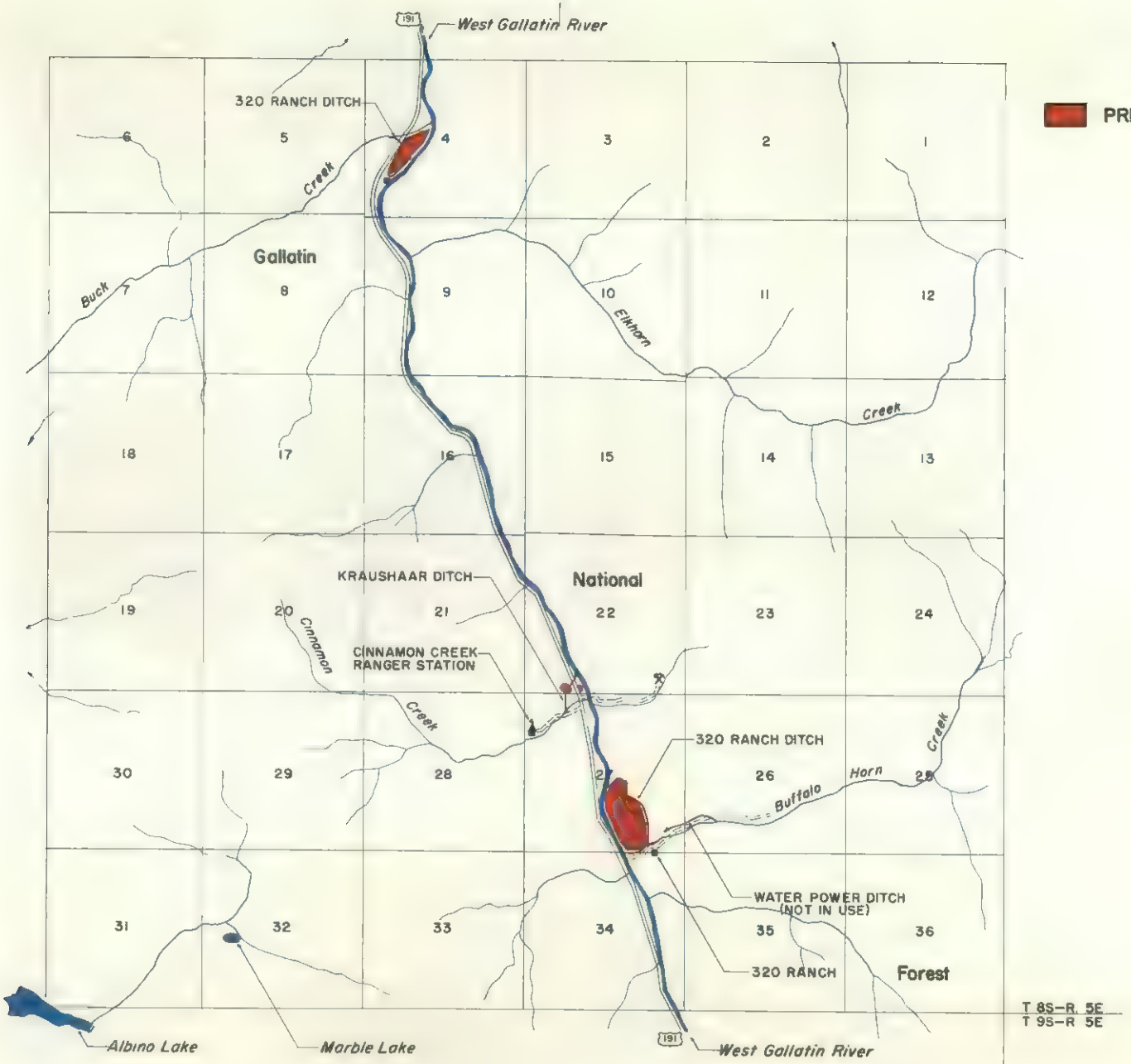

LEGEND
PRIVATE IRRIGATION
MADISON
COUNTY
Hollow Creek
Green
MILLER-ECKLEY DITCH (NOT IN USE)
OLD JOHN WILLIAMS DITCH (NOT IN USE)
OLD J. B. MOORE DITCH (NOT IN USE)
Spanish Creek
North Fork of Spanish Creek
TWIN CREEK DITCH
WYLIE DITCH NO. 1
FITZGERALD DITCH
OLD DITCH (NOT IN USE)
VOGEL DITCH
FINNIGAN DITCH
South Fork of Spanish Creek
Twin Creek
Forest
National
Gallatin
T. 4S.- R. 4E.
T 5S.- R. 4E.
T. 4 S-R. 3 E

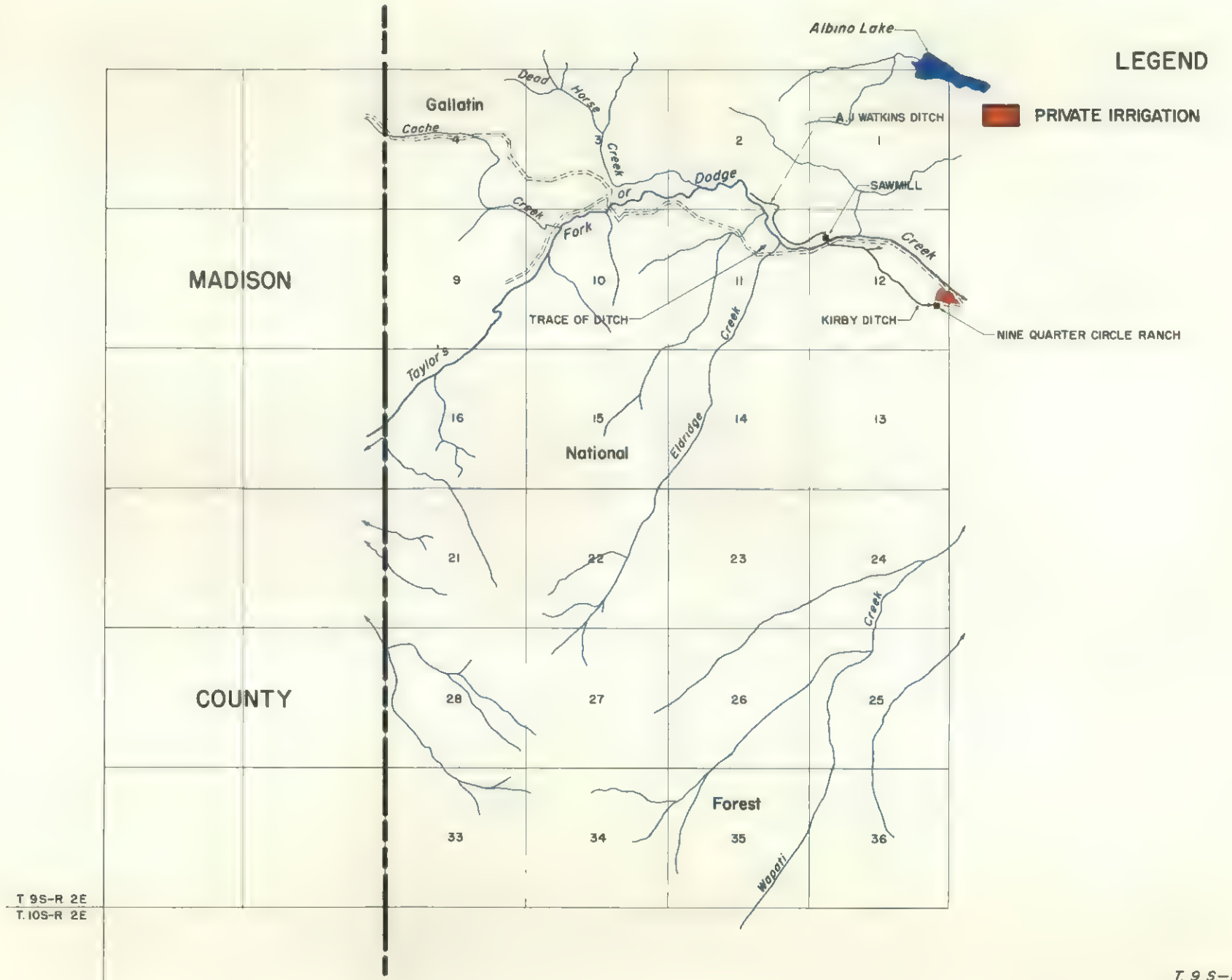

West Gallatin River
GILMORE—TODD DITCH
KLEINSCHMIDT CANAL
Yankee Creek
REESE OR HOLLOWAY (DITCH)
West Fk. Wilson Creek
East Fk. Wilson Creek
LEGEND
WEST GALLATIN CANAL CO. (KLEINSCHMIDT)
PRIVATE IRRIGATION
LIMESTONE DITCH (NOT IN USE)
J B MOORE DITCH (NOT IN USE)
Spanish Creek
SPANISH CREEK RANCH
WYLIE DITCHES NO. 1 & NO 2
LIMESTONE DITCH
Gallatin
National
Forest
STOCK DITCHES
SQUAW CREEK RANGER STATION
BORROWS DITCHES
EDDY DITCH
DIER DITCH
Hell Roaring Creek
West Gallatin River
Squaw Creek
Logger Creek
Squaw Creek
Lime Creek
Wilson Creek
Yankee Creek
Spanish Creek
Wilson Fk.
East Fk.
West Fk.
T 4S–R 3E
T 5S–R 3E
T 4S–R 4E

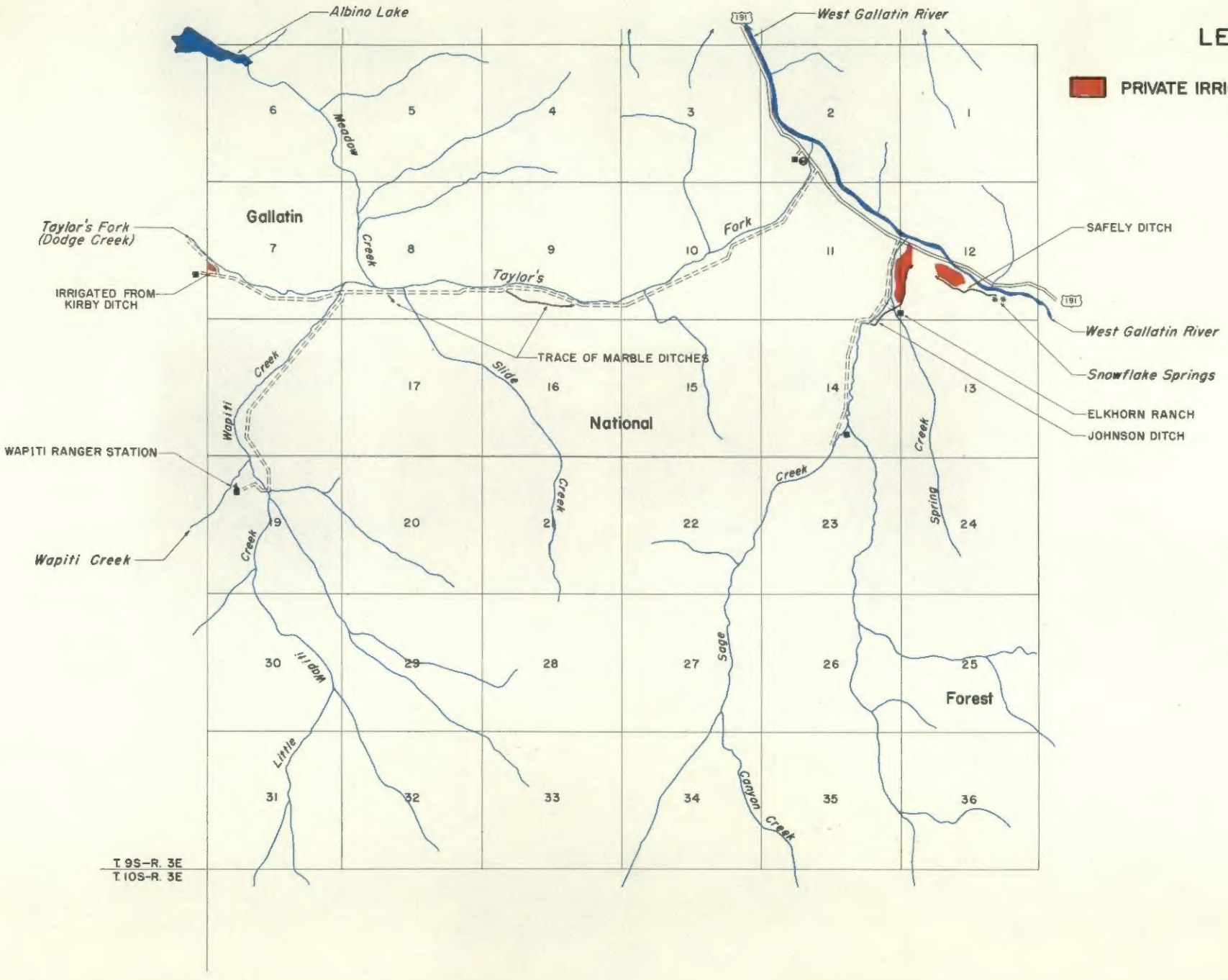

FIRST STANDARD PARALLEL SOUTH
LEGEND
PRIVATE IRRIGATION
MADISON
COUNTY
Gallatin
National
Forest
Hell Roaring Creek
Hell Roaring Lake
North Fork
Middle Fork
Dudley Creek
BUTLER DITCH
West Fork of West Gallatin River
CRAIL DITCHES
South Fork of West Fork
4
3
2
1
9
10
11
12
16
15
14
13
21
22
23
24
28
27
26
25
33
34
35
36
T 6S-R 2E
T 7S-R 2E
T. 6S-R. 3E

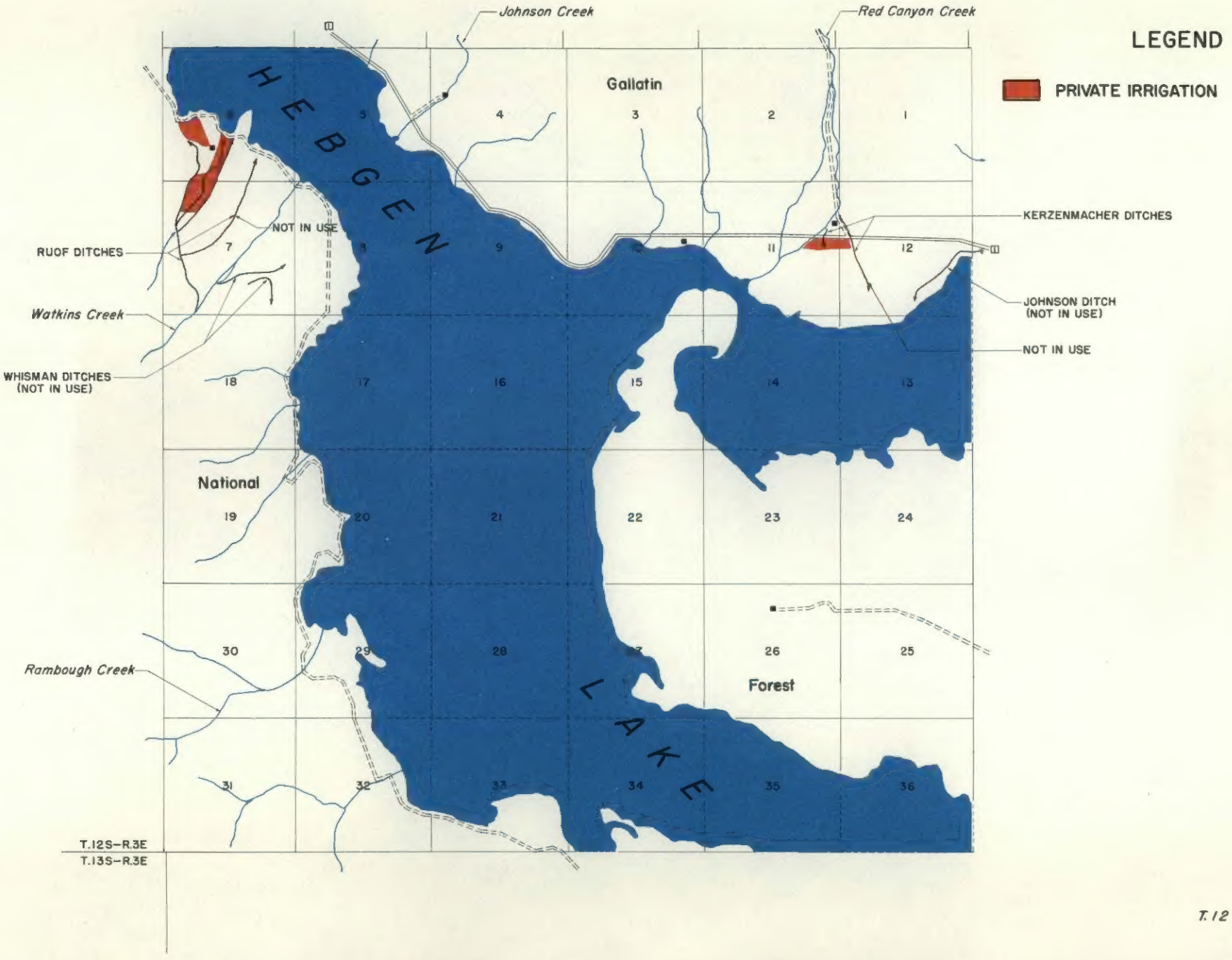

FIRST
STANDARD
PARALLEL
SOUTH
West Gallatin River
KARST CAMP
191
LEGEND
PRIVATE IRRIGATION
KARST DITCH
Cascade Creek
Lakes
Cascade
Gallatin
Mike
Creek
DIRRETT DITCH
Tamphery Creek
Deer Lake
Moon Lake
Asbestos
Creek
Deer
Portal
or Lost
Creek
National
Creek
Wilma
JACK SMITH BRIDGE
Dudley
Forest
BLANCHARD DITCH
DAM
Creek
Jack
Smith
Creek
Creek
Lakes
West Fork
Of West Gallatin River
South Fork Of
West Fork
Lekinski
Creek
Hidden
T 6S-R 3E
T. 7S-R 3E
MICHENER DITCHES
(NOT IN USE)
West Gallatin River
T 6 S-R. 4 E

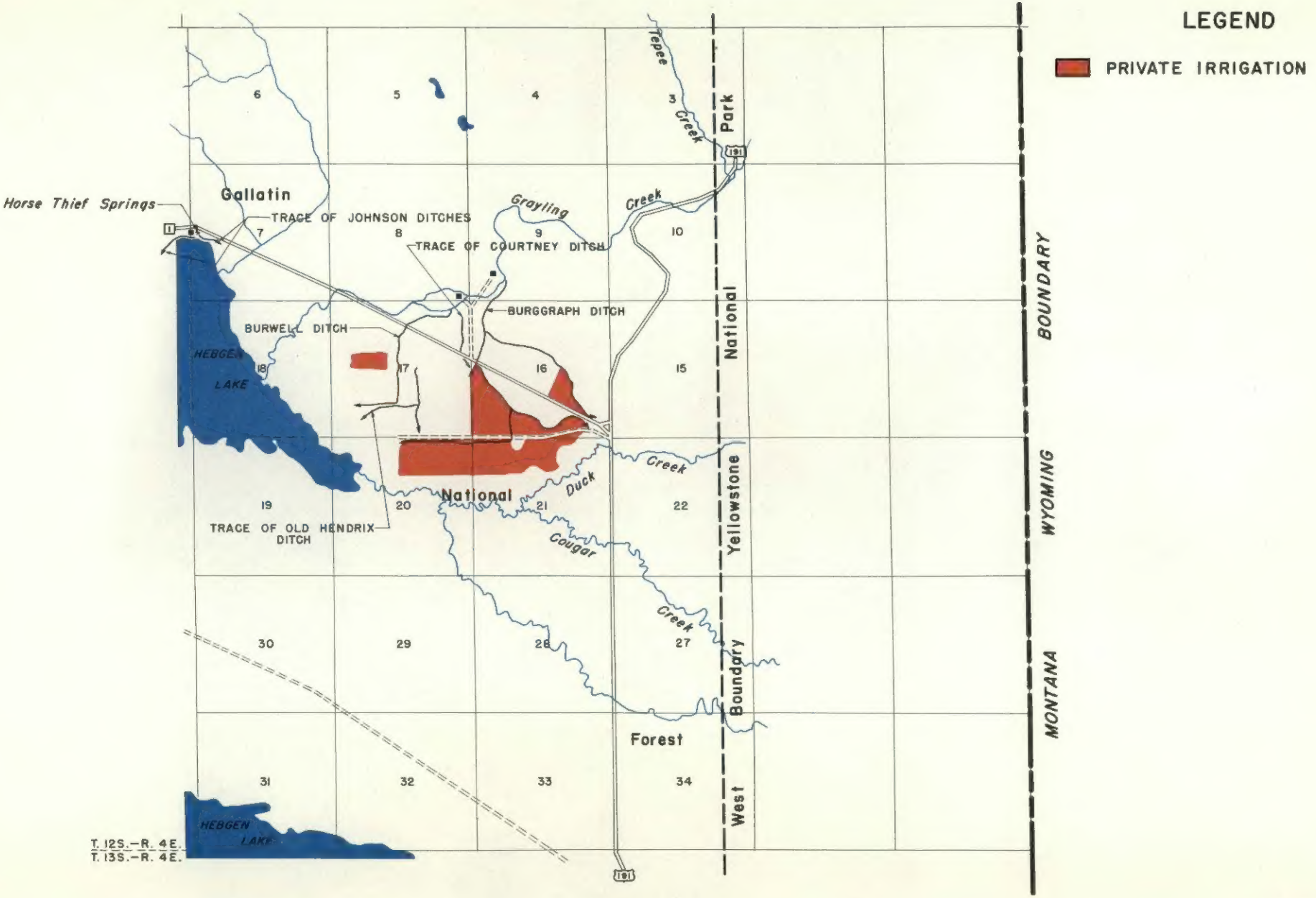

MICHENER DITCH (NOT IN USE)
West Gallatin River
191
MUD CREEK RESERVOIR
Gallatin
Levinski
Creek
Michener or Mud
Creek
MICHENER DITCH (NOT IN USE)
KIRSCHNER–WATERS DITCH
KNIGHT DITCH
SMITH DITCH
National
Porcupine
Creek
PORCUPINE RANGER STATION
Beaver
Creek
ROAN DITCH
OPHIR SCHOOL
KIRSCHNER–WATERS DITCH
Creek
STILLMAN DITCH
Twin
Cabin
Creek
LEMON DITCHES
Forest
T. 7S–R. 3E
T. 8S–R. 3E
West Gallatin River
LEGEND
PRIVATE IRRIGATION
T. 7 S – R. 4 E

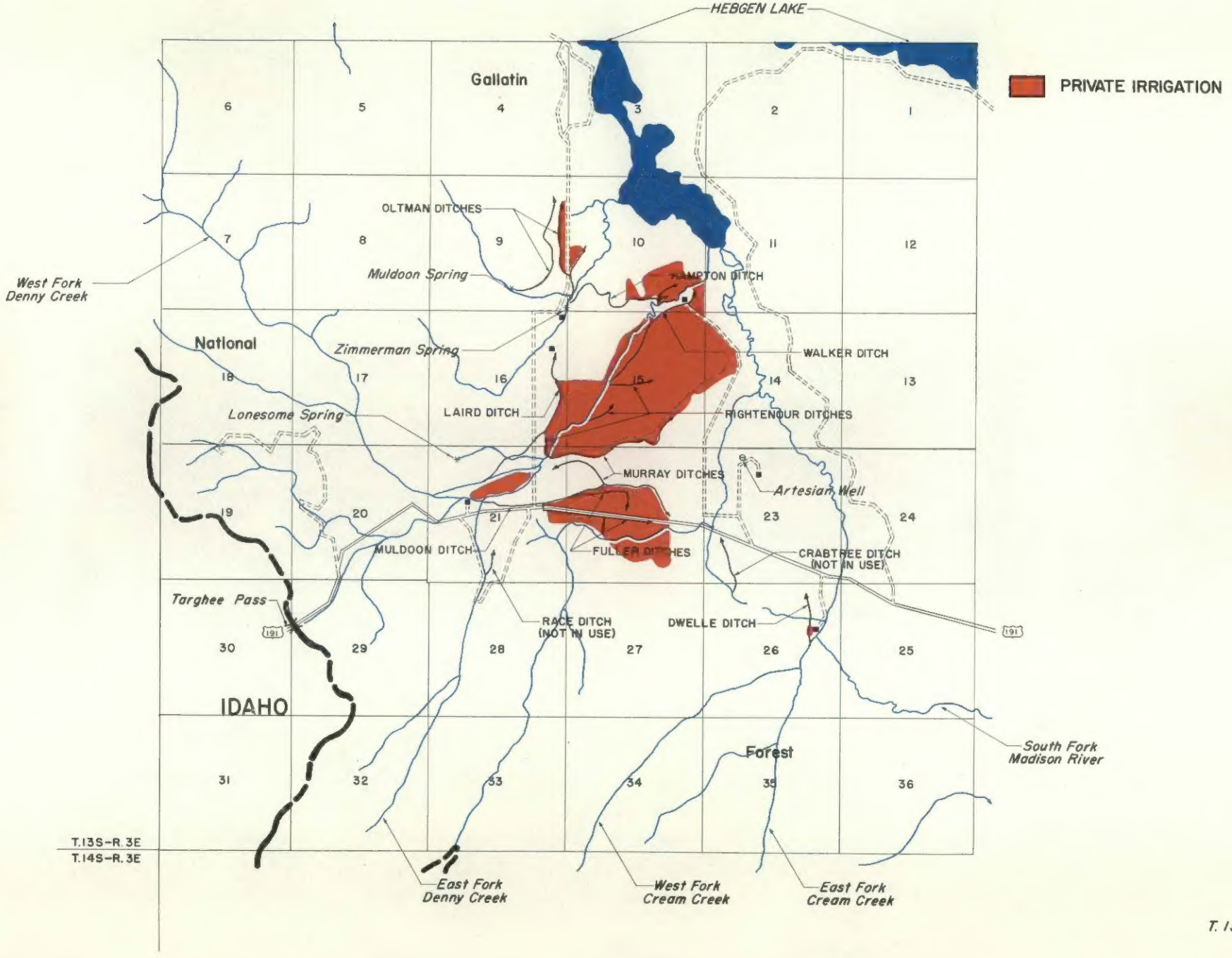

West Gallatin River
320 RANCH DITCH
Creek
Gallatin
Buck
Elkhorn
Creek
KRAUSHAAR DITCH
National
Cinnamon
CINNAMON CREEK
RANGER STATION
Creek
320 RANCH DITCH
Horn
Creek
Buffalo
WATER POWER DITCH
(NOT IN USE)
320 RANCH
Forest
Albino Lake
Marble Lake
West Gallatin River
T 8S–R. 5E
T 9S–R. 5E
T. 8 S–R. 4 E
LEGEND
PRIVATE IRRIGATION


Albino Lake
LEGEND
PRIVATE IRRIGATION
Gallatin
Dead Horse Creek
Cache Creek
A.J. WATKINS DITCH
SAWMILL
Dodge Fork
Creek
MADISON
9
10
11
12
TRACE OF DITCH
KIRBY DITCH
NINE QUARTER CIRCLE RANCH
Taylor's Creek
16
15
14
13
National
Eldridge Creek
21
22
23
24
COUNTY
28
27
26
25
Forest
33
34
35
36
Wapati Creek
T 9S-R 2E
T.10S-R 2E
T. 9 S—R. 3 E


Albino Lake
West Gallatin River
191
LEGEND
PRIVATE IRRIGATION
Meadow Creek
Gallatin
Taylor's Fork (Dodge Creek)
IRRIGATED FROM KIRBY DITCH
Taylor's Fork
SAFELY DITCH
West Gallatin River
TRACE OF MARBLE DITCHES
Snowflake Springs
ELKHORN RANCH
JOHNSON DITCH
Wapiti Creek
Slide Creek
National
WAPITI RANGER STATION
Wapiti Creek
Spring Creek
Sage Creek
Little Wapiti Creek
Canyon Creek
Forest
T. 9S–R. 3E
T. 10S–R. 3E
T. 9S–R. 4E


Johnson Creek
Red Canyon Creek
LEGEND
PRIVATE IRRIGATION
HEBGEN
LAKE
Gallatin
National
Forest
KERZENMACHER DITCHES
JOHNSON DITCH
(NOT IN USE)
NOT IN USE
RUOF DITCHES
NOT IN USE
Watkins Creek
WHISMAN DITCHES
(NOT IN USE)
Rambough Creek
T.12S–R.3E
T.13S–R.3E
T.12S–R.4E


LEGEND
PRIVATE IRRIGATION
Gallatin
Horse Thief Springs
TRACE OF JOHNSON DITCHES
TRACE OF COURTNEY DITCH
BURGGRAPH DITCH
BURWELL DITCH
HEBGEN LAKE
TRACE OF OLD HENDRIX DITCH
Grayling Creek
Teepee Creek
Duck Creek
Cougar Creek
National Park
Yellowstone National Forest
West Boundary
BOUNDARY
WYOMING
MONTANA
T. 12 S.—R. 4 E.
T. 13 S.—R. 4 E.
T. 12 S—R. 5 E


HEBGEN LAKE
PRIVATE IRRIGATION
Gallatin
National
IDAHO
Forest
OLTMAN DITCHES
Muldoon Spring
West Fork
Denny Creek
Zimmerman Spring
Lonesome Spring
LAIRD DITCH
WALKER DITCH
EIGHTENOUR DITCHES
MURRAY DITCHES
Artesian Well
MULDOON DITCH
FULLER DITCHES
CRABTREE DITCH
(NOT IN USE)
Targhee Pass
RACE DITCH
(NOT IN USE)
DWELLE DITCH
South Fork
Madison River
East Fork
Denny Creek
West Fork
Cream Creek
East Fork
Cream Creek
T.13S-R.3E
T.14S-R.3E
T. 13S-R. 4E